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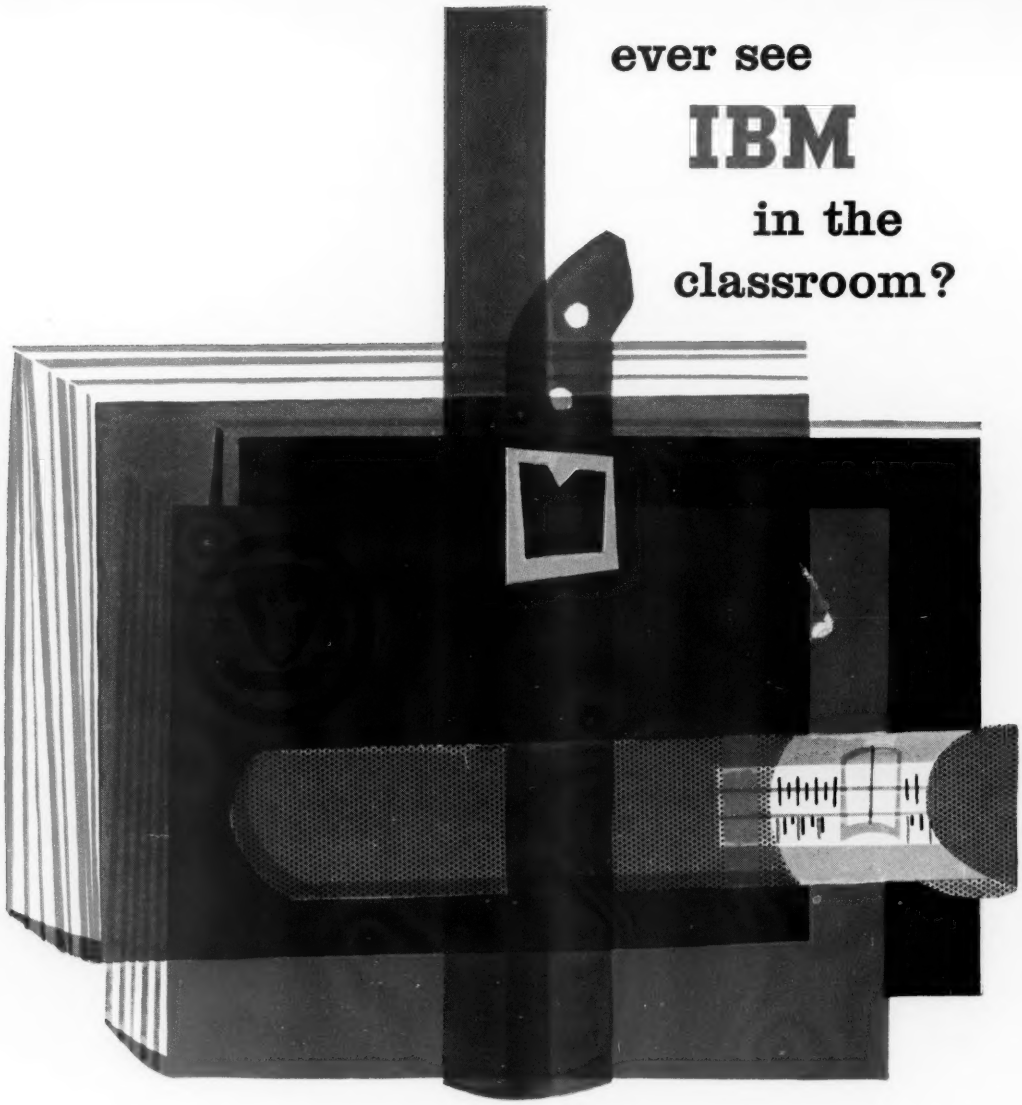

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of Controllers Institute of America

1. To establish, coordinate and maintain through authorized management, an integrated plan for the control of operations. Such a plan would provide, to the extent required in the business, cost standards, expense budgets, sales forecasts, profit planning, and programs for capital investment and financing, together with the necessary procedures to effectuate the plan.

2. To measure performance against approved operating plans and standards, and to report and interpret the results of operations to all levels of management. This function includes the design, installation and maintenance of accounting and cost systems and records, the determination of accounting policy and the compilation of statistical records as required.

3. To measure and report on the validity of the objectives of the business and on the effectiveness of its policies, organization structure and procedures in attaining those objectives. This includes consulting with all segments of management responsible for policy or action concerning any phase of the operation of the business as it relates to the performance of this function.

4. To report to government agencies, as required, and to supervise all matters relating to taxes.

5. To interpret and report on the effect of external influences on the attainment of the objectives of the business. This function includes the continuous appraisal of economic and social forces and of governmental influences as they affect the operations of the business.

6. To provide protection for the assets of the business. This function includes establishing and maintaining adequate internal control and auditing, and assuring proper insurance coverage.

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The Controller

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VAZSONYI VS. WEINWURM

Editors, THE CONTROLLER:

The problems of the application of scientific methods to managerial decision-making are widely discussed these days. Therefore, the case study of such an application which was recently published in THE CONTROLLER ("Statistical Techniques for Financial Planning and Forecasting" by Dr. Andrew Vazsonyi, May 1957) should arouse a great deal of interest among business executives. The author is a distinguished mathematician who has been very active in developing proper techniques for such applications.

It is the purpose of this communication to point out a number of significant shortcomings of this article which are indicative of the difficulties involved in translating the principles of the scientific method to business problems.

Like many or even most scientists, Dr. Vazsonyi is unfamiliar with the more recent developments in the field of accounting. He describes accounting as a "very exact sort of procedure" and explains that "from uncertain forecasts, exact accounting calculations for revenues, expenses, profits, etc., are carried out to the last dollar and cent." Thus it appears that he has never heard of "managerial accounting" which deals with future developments in broad terms rather in dollars and cents.

It is from this point of view that Dr. Vazsonyi presents as "a new method that has been found useful in financial planning" techniques which have been familiar to management accountants for more than 20 years and have been described in the publications of the National Association of Cost Accountants and in a number of books published in recent years.

However, Dr. Vazsonyi must be found guilty of one of the major crimes a management accountant could commit namely to use data derived from the past as a natural and undisputed guide to the future. It was not easy to get this principle accepted but it is now widely recognized in the literature and in actual business applications.

Dr. Vazsonyi's position is quite typical of the scientist and for obvious reasons. Time is not a major factor in the natural sciences. The same laws which are considered valid today can be assumed to have prevailed a thousand years ago and will continue to be correct in another thousand years. But this is not true in the field of business and business management. Here there can be no assumption that the facts of the past will continue to dominate the future. Whether or not this will be true cannot be taken for granted but must be determined in each particular instance. Certainly, the past is important as a guide for the future but merely as a starting point.

Another weakness of Dr. Vazsonyi's presentation is inadequate consideration of the all-important distinction between fixed and variable costs. He refers to that distinction from time to time but only in a minor way. In fact, however, this is a decisive issue and there is no reference to or recognition of the very great difficulties in first determining and then keeping up to date this distinction.

Undoubtedly, Dr. Vazsonyi's method of presentation will satisfy those who are used to thinking and reasoning in algebraic terms. But this very method of presentation may make it more difficult to convert businessmen to the recognition of scientific methods for the solution of their own problems. They may rest assured that he does not produce anything they have not been aware of for quite a while.

ERNEST H. WEINWURM
DePaul University
Chicago, Ill.

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Editors, THE CONTROLLER:

In my paper, "Statistical Techniques for Financial Planning and Forecasting," (THE CONTROLLER, May 1957) I presented a method that has been found useful in financial planning, at least in one client corporation. As I thought this method might be applicable to other busi-

(Continued on page 470)

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★ **INTRODUCING AN ORGANIZATION TO BUDGETARY CONTROL**

by Robert R. Renner

★ **THE THREE ELEMENTS IN MEASURING CHANGE IN EARNINGS**

by William P. Ryan

★ **PLANNING AND CONTROL AT A NAVAL ORDNANCE PLANT**

by C. W. Mowery

ness, I submitted this paper to THE CONTROLLER in the hope that its readers will find it possible to apply it in their own business. Any discussion, therefore, which will encourage or discourage readers of THE CONTROLLER in their attempts to apply this technique will be of benefit to the readers. It will be particularly important to clarify whether there are shortcomings in the paper so your readers will not be misled.

Professor Weinwurm states that the techniques presented in the paper "have been familiar to management accountants for more than twenty years and have been described in the publications of the National Association of Cost Accountants and in a number of books published in recent years." Therefore, it appears to me that it will be important to know where these techniques have been employed. I have reached several hundred people through various lectures but have never been advised of firms that employ these techniques. I think it would be of considerable interest to readers of THE CONTROLLER if Professor Weinwurm described further case histories. It would be, indeed, very interesting to see how the method is being used and what are the similarities, what are the dissimilarities, and what are the shortcomings.

Professor Weinwurm then finds me guilty of the "major crime" that I use data derived from the past as a "natural and undisputed guide for the future." He has a good point here. The fact of the matter is that the client that is using this technique found it necessary to introduce various modifications. It was found, for instance, that when a particular control technique is changed then the forecasting system must be changed accordingly. However, we found that this is not particularly difficult to do. If Professor Weinwurm could show us some case studies where these techniques are being used, then very likely we would see what modifications need to be applied. I, for one, would very much welcome such a discussion, as it would help me in my work.

Professor Weinwurm states that another weakness of my paper is that there is no distinction made in fixed and variable costs. In the case study I have described, we have not found it necessary to make this distinction. We found that the way the regression coefficients are defined automatically takes care of the fixed costs. It is possible that in our future work we will encounter cases where this method of approach is not valid. Then, either the method has to be modified, or abandoned. How likely that this would happen I cannot tell as I do not have a broad enough experience in the application of the technique.

Professor Weinwurm states that my method of using algebraic terms makes it difficult to "convert" a businessman. I admit that I have some difficulty in putting myself in the shoes of a "businessman." However, the experimental evidence is that the paper and my talks have been favorably received. Let, then, the businessmen be the judge of this point.

Finally, Professor Weinwurm implies at the end of his letter that there is nothing in my paper that businessmen have not been aware of for quite a while. What would be more interesting to know is, whether the technique is being used or not.

ANDREW VAZSONYI
The Ramo-Wooldridge Corporation
Los Angeles, California

RE: H.R. 8002

Editors, THE CONTROLLER:

The comments in the September issue of THE CONTROLLER (Controlling "Carry-Overs" on page 421) brought to mind an editorial in one of our city's daily newspapers, which mentioned that Controllers Institute was supporting H.R. 8002, under which the Federal Government would establish annual accrued expenditure budgeting.

I recognize that the item in THE CONTROLLER merely commented on the bill being considered by Congress, but did not constitute an endorsement. Is it true that the Institute has announced formal support of H.R. 8002?

B.D.E.

Controllers Institute has not issued any statement formally supporting H.R. 8002. The editorial which our reader undoubtedly refers to was similar to one published in newspapers in several other cities. Contact with the Citizens Committee for the Hoover Report, which had indicated in one of its publications that Controllers Institute supported H.R. 8002, brought a letter of regrets regarding this reference to Institute support from the research consultant of the Citizens Committee for the Hoover Report.

The Institute's policy regarding legislation such as H.R. 8002 has been long established on the basis that such legislation does not fall within the scope of the Institute's program, and that it is basically a matter for the concern of individual members. In addition, it is an appropriate item for comment or other editorial treatment in THE CONTROLLER, *which continually aims to present material of interest to corporate controllers and financial officers.*

As stated on the contents page of each issue of THE CONTROLLER:

"The views expressed in the various articles are those of the authors and not necessarily those of Controllers Institute of America."

—The Editors

Scanning the Scene

Financial Reporting in a Changing Society

The challenges and problems of financial reporting in a changing society were considered in an address by Marquis G. Eaton, in June 1957, before the Illinois Society of Certified Public Accountants. Mr. Eaton, partner in the public accounting firm of Eaton and Huddle, San Antonio, Texas, is the 47th president of the American Institute of Certified Public Accountants. Notes Mr. Eaton:

"We are living in an economy which is quite different from anything the world has known before. It is doubtful whether anyone now alive thoroughly understands just what is happening to our economic system and what its future shape will be. Clearly an evolutionary process is going on—and at headlong speed. Pressures build up in various quarters and react upon each other, often in unpredictable ways.

"One thing that holds the economy together under all these pressures, and in the midst of this swift evolutionary passage through time, is our system of financial reporting.

"Financial reporting is simply the expression in terms of a common denominator of the whole complex network of elements which make up a business—land, buildings and machinery, raw materials, people at work, interrelated legal obligations—and, most important, the results which they produce. Without adequate information about the results of business operations no one could make intelligent decisions, and our economy would fall apart."

Further excerpts from Mr. Eaton's address include:

"The accounting profession . . . has accepted the responsibility of leadership in the incessant search for better methods of financial reporting. But it does not have, cannot assume, and in my opinion should not permit itself to be regarded as having the sole responsibility for the results."

> *"Obviously corporate management does have and must have a part in determining the broad objectives and basic assumptions underlying corporate financial reporting."*

"It would be a great misfortune for American business, and the whole economy, if uniform accounting rules were to be prescribed by governmental fiat. It would probably mean the end of progress."

> *"Other groups, such as bankers, financial analysts, economists, and financial editors, may have some responsibility to advise how financial statements may be made more useful for the purposes they are intended to serve."*

When Is "Too Big" Valid?

Two reports issued by the Chamber of Commerce of the United States on the subject of "Measurement of Economic Concentration" will hold interest for corporate controllers and financial officers because of the recent hearings on the subject by the Subcommittee on Antitrust and Monopoly of the Senate Judiciary Committee. The Chamber's reports, in the words of Emerson P. Schmidt, director of its Economic Research Department, attempt to throw light on "the validity of so-called concentration ratios . . . that is to say, the Chamber is taking a close look at the gauge that is being used to measure concentration, in order to determine (a) whether concentration ratios are conceptually valid measures of economic concentration; and (b) whether concentration ratios are statistically accurate measures of economic concentration."

The first report on the *significance* of concentration ratios relies heavily upon published statements of scholars who have been concerned with monopoly, competition and economic concentration. From a sampling of the testimonies of several leading authorities in the field, the Chamber's report presents some of the "conceptual inadequacies of concentration ratios" and concludes with the following observation by Dean Edward S. Mason of Harvard University:

> *"That market power is an elusive quality requires no demonstration . . . it is not possible, nor will it ever be possible, by calculating market shares . . . or other hocuspocus, to present an unambiguous measure of the degree of monopoly."*

In the second of its reports, the United States Chamber considers the *statistical reliability* of concentration ratios. Again, there is ample quotation from a variety of authoritative sources, concluding with a significant statement by Jesse J. Friedman, former economic consultant to the Senate Judiciary Subcommittee on Antitrust and Monopoly. Mr. Friedman who directed the Subcommittee's study on concentration in American industry summarized his evaluation of his own work in the following words:

> *"The forthcoming Senate Antitrust Committee Report on Concentration is not, then, the perfect instrument for anatomizing the structure of American industry. I have no illusions about the technical imperfections that are inherent in it . . ."*

A third and last report in this series, to be published after the public release of the Senate Subcommittee study, will provide an analysis of that study. On the basis of the questions as to the conceptual validity, as well as the statistical accuracy of concentration ratios, as raised in the Chamber's two reports, there should be a well-alerted readership for the Senate Subcommittee's report, when it is released.

—PAUL HAASE

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Recognizing and Evaluating Profit Opportunities

Frank S. Capon

Finding a yardstick for evaluating all opportunities on a comparable basis

RECOGNITION of new profit opportunities for industry has sometimes been accidental or haphazard. The planned approach, however, is most likely to bring better results in the long run. New profit opportunities can be pinpointed and principles can be established to determine those possibilities to be selected for serious consideration and evaluation, thus ensuring that the costly process of economic, technical, engineering and financial analysis and evaluation is justified by a reasonable chance of success.

Before delving into more specific comments about evaluation of profit opportunities, we should note a few very general observations in the nature of background against which subsequent remarks should be constantly viewed.

1. When faced with the necessity of selecting one or more from a number of diverse profit opportunities, one must find a sound yardstick for evaluating all such opportunities on a comparable basis, though the nature of each may differ greatly.

2. In the final analysis, the primary aim of the entrepreneur is the rate of profit per dollar of investment over a long period, and the best yardstick for evaluating diverse projects is inevitably net return on gross investment. (This obviously true comment must always be coupled with the equally true statement that long-run profits will only come to the company that is fulfilling a useful service or producing a needed product and doing its job for the community as efficiently as possible.)

3. The measurement of true profit in anything except a single-product company requires a sound and objective apportionment of indirect costs and expenses. There are often great pressures to bend the allocations in order to favor a particular product, but such tampering with accounting principles can easily lead management to unsound decisions on profit evaluation.

4. There rests on industrial accountants a very real responsibility for marshalling all the facts which have a bearing on evaluation of a new profit opportunity and for recording them in an honest and objective manner so as to aid management in reaching sound decisions based on the best available forecasts of markets, revenues, costs, taxes and other pertinent economic or financial trends.

These are the vital background considerations for the accounting or financial man concerned with evaluation of profit operations—the considerations for the engineer, the research scientist, the sales promotion manager may be quite different but in the final analysis all must be balanced and weighed against each other at the decision stage.

A RE-CHECK ON EXISTING PRODUCTS

Any company embarking on a deliberate program of profit expansion will first take a look at its existing operations to see if the foundation is sound. *How does one go about this?* In brief, find the answers to a series of leading questions, such as:

What are the potential markets for the present products, both at home and abroad, bearing in mind the competitive position in the industry, potential competition from new products, domestic tariffs, foreign tariffs, and any other factors affecting the total demand for the product and the total capacity of the industry to supply?

Is it necessary to expand present plants to maintain an existing position in the industry?

Are there any steps that can be taken to improve one's share of the market?

Can capital be employed more profitably in other lines than in any part of the existing business?

Would consolidation of operation in fewer lines increase the rate of return on operating investment and make funds available for more profitable opportunities elsewhere?

Reasonable answers to these and similar questions should precede any planned program for profit expansion and should, of course, be obtained at fairly regular intervals for all existing operations.

FRANK S. CAPON, a past national director of Controllers Institute, gave this talk at a Cost and Management Conference of the Society of Industrial and Cost Accountants of Canada. Born and educated in England, he came to Canada in 1930 and joined Riddell, Stead, Graham and Hutchison, Montreal, Que.; in 1938 he joined Canadian Industries Ltd. —appointed assistant treasurer 1946, treasurer 1949; in 1954 became secretary and treasurer of Du Pont of Canada Securities Ltd. and Du Pont Company of Canada Ltd.; is now treasurer and a director of the two merged companies.

Millar

CONSIDERATIONS OF BUSINESS DIVERSIFICATION

Having checked on existing lines, a company proceeds to evaluate the opportunities for branching out into new businesses—in other words, by diversification, to seek that stability and security which seem so desirable to companies whose single-line operations are subject to a strong cyclical fluctuation or whose business is vitally affected by economic swings in one or two basic industries.

Here again, the approach is to seek reasonable answers to a handful of searching questions, such as:

What are the potential markets, both domestic and export, for each new product being considered? What is the range of market based on different price assumptions?

Is this field at present served by a competitive manufacturer? If so, does one's company have a particular advantage in know-how, plant location, patents, processes, service, or any other factor which causes it to be confident of taking a sufficient share of the market to make an entry profitable?

Is the market at present supplied from foreign sources? If so, what is known, or what can be surmised, about their future plans? How should one's company stand if they should decide to come in to protect a vested position?

If the product is new what are the low and high estimates of potential markets?

These, and related questions, must be answered in a general way before planning for entry into new businesses can proceed with any assurance of success. At this stage two factors are absolutely vital—speed and secrecy—speed because you must assume that others are covering the same ground, studying the same opportunities, and probably coming to the same conclusions; secrecy for the very reason that others with similar intentions may move suddenly to protect themselves if they hear that a competitor is approaching a decision which may beat them out in a new and profitable opportunity. For this very reason, judgment may sometimes dictate that plans be announced in order to forestall a competitor working along the same lines.

Usually, therefore, tentative decisions must be made based on general answers to these questions, in order that detailed planning can proceed with a minimum of delay. The detailed planning will bring out the accurate or considered answers on which the final decision to proceed must be based.

COMMON FACTORS IN MOST PROFITABILITY STUDIES

From the above it is clear that the more significant factors are common to all profitability studies—whether these be aimed at existing products or products not now manufactured. These common factors may be summed up as:

Market studies and forecasts, and the economic, commercial and operating assumptions on which such forecasts must be based;

Accounting policies, particularly those concerned with measurement of costs, allocation of fixed costs, expenses, etc;

Factors concerning the geographical location of plant, sales offices and administrative offices; and

Vital incidental knowledge, such as analysis of tariff structures at home and abroad, technical information, patent positions, raw materials supply, transportation facilities, availability of power and other services, availability of manpower, and all the other items which together comprise the economics of manufacture.

Since all these factors are present in studies of new products, with the chief items being common to both new and old products, we will probably cover the ground more completely if we run over the process of evaluating the profit possibilities of undertaking the manufacture of a new product, leaving one to make the necessary adaptations for evaluation of existing lines of business. It is realized that one is directly concerned with the measurement of revenue, costs and profit for such studies, rather than the choice of a plant site or the evaluation of one type of equipment as against another. However, many factors not strictly in the realm of accounting or finance must be contained in the final document on which directors must make a decision, and it may well fall to one's lot to edit this document or even to put it together from the various separate reports that will be produced by such staffs as research, commercial development, engineering, sales, legal, and real estate. For this reason, we will at least touch on all the important considerations affecting the evaluation of a new profit opportunity in manufacturing, whether or not these may fall within the direct scope of one's responsibilities.

THE SEARCH FOR NEW OPPORTUNITIES

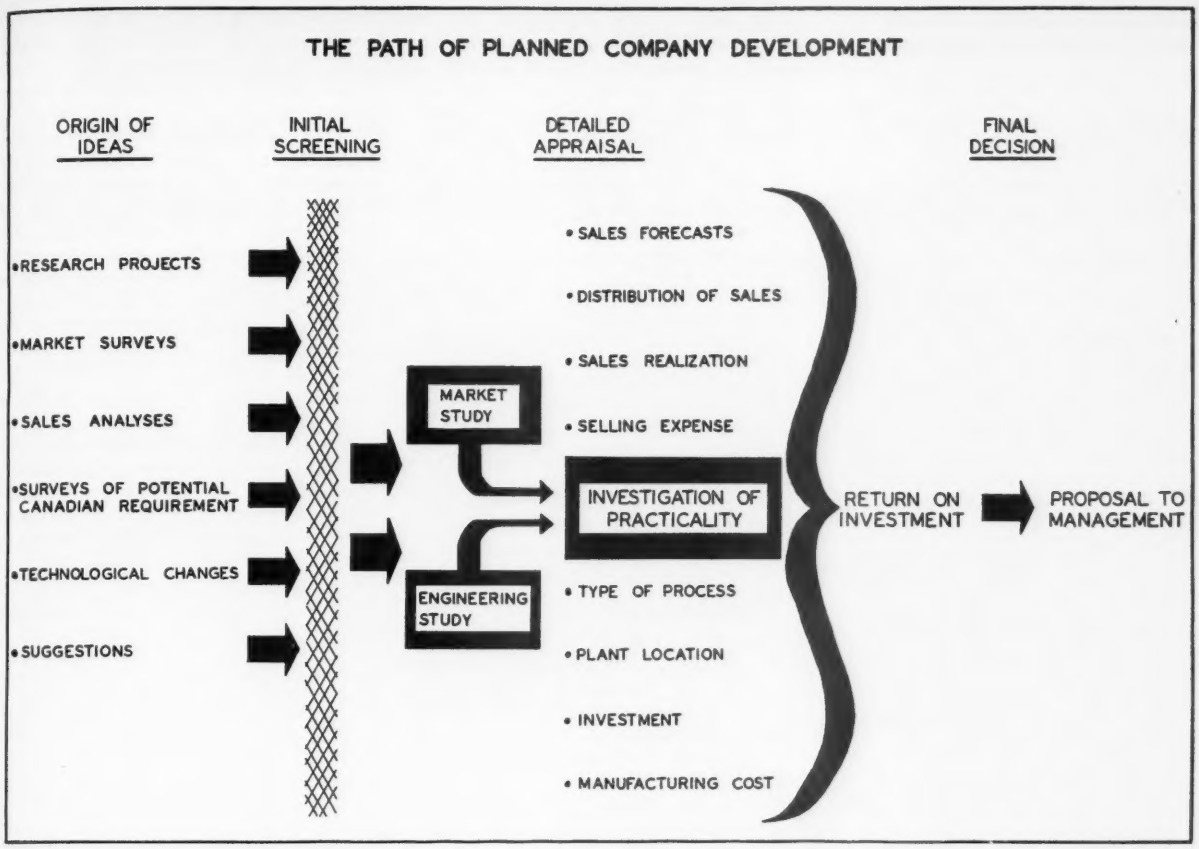
Before a new manufacturing opportunity can be evaluated, it must first exist as an idea in the mind of someone in the organization, then be developed as a practical idea, and finally as a project worthy of serious study. The generation of ideas is to some extent accidental—any member of an organization may conceive one at any hour of the day or night because of a thought process started up in a business or social discussion, while reading, while watching TV, or simply while daydreaming. The important thing is to be sure that the organization is "idea conscious," and that ideas be passed on to the proper unit for evaluation.

However, no sound organization can rely on this hit or miss approach to the generation of new ideas, and any planned growth program should be supported or initiated by a research and commercial development department. In some large companies this may include a big scientific staff housed in a full-scale research laboratory —in smaller companies it may boil down to one or two capable and imaginative individuals whose knowledge of the business and potential diversification opportunities is such that they will probably develop most of the possible ideas from a regular review of all the commercial intelligence available on their particular subjects.

The research and development department is therefore specifically charged with the development of new ideas stemming from a constant review of all current published information which may bear on existing, or possible new businesses, and from such primary research work in untried areas as the company can support. It also acts as a clearing house for ideas from all departments, and undertakes whatever scientific or other studies are necessary to make initial and very general tests of the practicability of new ideas. In many companies a unit of the organization is given this title. In many others this type of work is carried out by officers or units with very different titles. No matter what the form of organization may be, no matter how large or how small, the things one must

THE COST OF RAISING CAPITAL

Underwriting costs for companies listed on the New York Stock Exchange averaged $33,700 less for every $1 million raised by selling common stock than for companies not so listed, according to a survey by the New York Stock Exchange. A survey of 104 common stock issues in 1956 53 sold by listed and 51 by nonlisted companies, for a total capitalization of $800 million indicated that the listed companies paid underwriters an average of $2.60 for every $100 of new capital obtained by selling common stock while nonlisted companies paid $5.97 per $100.



do in evaluation of profit opportunities are virtually standard.

Experience shows that most new profit opportunities will come from deliberately planned studies in preselected areas, rather than from chance ideas that happen to occur to people, and it therefore falls on the research and development people to determine those areas for study which are most likely to prove fruitful. This process is not haphazard—rather it must be based on a careful and objective appraisal of the experience and technical knowledge available, of the abilities of the key personnel in the organization, and other advantages or limitations peculiar to the organization such as financial strength and so forth. The selection of areas for concentrated study is vital because this selection will probably determine the future course of the company.

PRELIMINARY EVALUATION OF A NEW PRODUCT

Naturally, few ideas pass muster when subjected to a detailed and objective examination. Some would not integrate with present operations or would be outside the areas bounded by the company's special skills, technical knowledge, or financial resources. Some would be unprofitable because of obvious lack of markets or sufficient volume of output. Thus a preliminary screening of ideas must take place.

Once this screening has shown a potential new product to be worthy of special interest, a concentrated effort must be made to proceed as fast as possible with the evaluation on which to base a final decision for or against manufacture. In our company, this concentrated effort is done by teams which may be composed of development personnel or which may include personnel on loan from other operating or auxiliary departments, depending on the particular aspects which must be studied in each project. Our policy on this matter is simple—it is of primary importance that we take advantage of profitable opportunities as they arise, therefore we must put onto the study of such opportunities the best possible men wherever they may be located in the company.

The development group must establish quickly the patent position on the new product:

Is it covered by existing patents?
Who holds patents?
Are they available for license?
If not covered by patents, is it patentable?

At the same time, they must establish the availability of technical knowledge required to manufacture the product:

Is any process or operating know-how essential? Is it available?

Also at this stage the feasibility of manufacture should be tested in such ways as pilot plant or laboratory scale manufacture (if the product happens to be susceptible to manufacture in experimental quantities), test runs in the plant if it is of a nature that can be produced experimentally with existing equipment, or possibly even produced experimentally by one of the service organizations set up for this purpose.

Coincidental with the technical and production analysis is the commercial evaluation of the product—carried out by personnel with special abilities in market analysis, economics, and engineering—and also at least a preliminary financial study. This activity covers:

Market analysis
Engineering studies leading to decisions on size and location of plant
Financial study to determine return on investment and availability of capital.

MARKET ANALYSIS

Before measuring the potential market, the proven and possible new uses for the product must be agreed on within reasonable limits. Estimates of possible new outlets or uses may be "out in the blue," but any reasoned guess is better than no opinion at all, and the reasoned guesses on

possible demand for the product will necessarily be an important factor in the ultimate report on evaluation.

Next comes the market analysis, or the measurement in specific terms of probable sales for existing or foreseeable uses of the product. A number of facts are significant in measuring markets, and can best be illustrated by listing some of the questions that must be answered by the market study experts:

What is the competitive situation—from other domestic manufacturers? From foreign manufacturers?

Where are potential customers located?

What share of the market can the company obtain?

Are there large seasonal variations in demand?

What effect would price changes have on demand? What are probable future price trends?

What is the tariff situation into the home country and into other countries which are logical export markets?

Is the market stable or subject to product obsolescence?

What are the possibilities of major technological changes?

What is the effect of freight and other distribution costs from plant site to customer?

What effect will probable future economic trends have on major customers or consuming industries?

These, and many similar questions must be answered before the development team can decide on a forecast of probable volume of sales under the conditions most likely to occur.

ENGINEERING STUDY

The engineering study, concerned with the choice of plant site and design of plant buildings and equipment, can be proceeding in the meantime to whatever extent is possible pending a forecast of plant capacity needed to supply demand. Once this forecast comes from the market study group, the engineers must refine their preliminary design work and produce the first estimate of construction and site costs. Here again a number of questions must be answered:

What alternative processes must be considered before deciding on the optimum for the company?

Where should the plant be built, having regard to such factors as availability of raw materials, power and other services, labor supply, proximity to markets, transportation facilities?

Should raw or intermediate materials be purchased or manufactured?

How can cost per annual pound of production be minimized?

What will production costs be?

What provision should be made now for expansion?

It is in this stage of the evaluation of a new product, or of the future of an existing product, that an intimate knowledge of the market, its strengths and its weaknesses, its temperament and its resources, can make the difference between success and failure.

Once a geographical area has been selected for a plant site, land acquisition becomes a problem. Often a site must be placed under option before the project can be properly evaluated. Such activities must be conducted in strictest secrecy, usually through third parties, if site costs are to be kept to a minimum. Such diverse factors as municipal zoning regulations; availability of power, water, transportation, and other services; disposal of effluent; community relations; and labor conditions in neighboring industries must all be weighed. All these are items having an important bearing on the capital cost of the plant or the subsequent cost of operation.

The design of plant buildings, process machinery and equipment must be left to the engineers, who will require a considerable degree of latitude in arriving at their estimates of construction costs. Often a fixed price contract would prove expensive, and if the job is to be let on a "cost plus fee" or "cost plus fixed fee" basis, reasonable allowances must be made for field administration, engineering design costs, and contingencies. Unless an exorbitant amount of time and money is to be spent at the design stage, decisions must be based on construction cost estimates accurate only within certain limits, and allowance must be made for contingencies in order to arrive at a final construction cost estimate. If this allowance is too high, it may well kill the project as being unattractive; if the allowance is too low, it may lead to an unsound decision to proceed.

THE FINANCIAL OR ACCOUNTING STUDY

Once provisional decisions have been made on plant location and size, the accounting staffs can start work with the engineers on estimates of production costs. The application of cost accounting techniques presents no particular problem. One point should be emphasized. When costing existing operations, the accountant is concerned with an accurate presentation of actual costs and possibly with a study to see how costs can be reduced and profits increased. When determining operating costs for a proposed plant, however, he is compiling data which will affect the investment of capital not yet committed. In other words, the impact of his work in the latter case is much, much greater than in the former.

From the market analysis group, an estimate of sales value and volume by years will have been received. The engineering group will have provided an estimate of the capital needed to build the plant. The cost accountants, working with the engineers, will have estimated the costs of operating the plant, and, based on all this information, they can also produce an estimate of the investment needed in inventories and other working capital. Thus we have all the factors needed to solve the return on investment equation, which is the key to the decision for or against proceeding with the project.

FINAL DECISION

The final decision on any important project is invariably taken by the Board of Directors, since it involves the commitment of large sums of shareholders' money on a basis which cannot readily be reversed. Directors are necessarily remote

(Continued on page 505)

"Now his secretary will spin him around . . . I wish he'd be a little more serious about who gets promoted around here!"

BANKING

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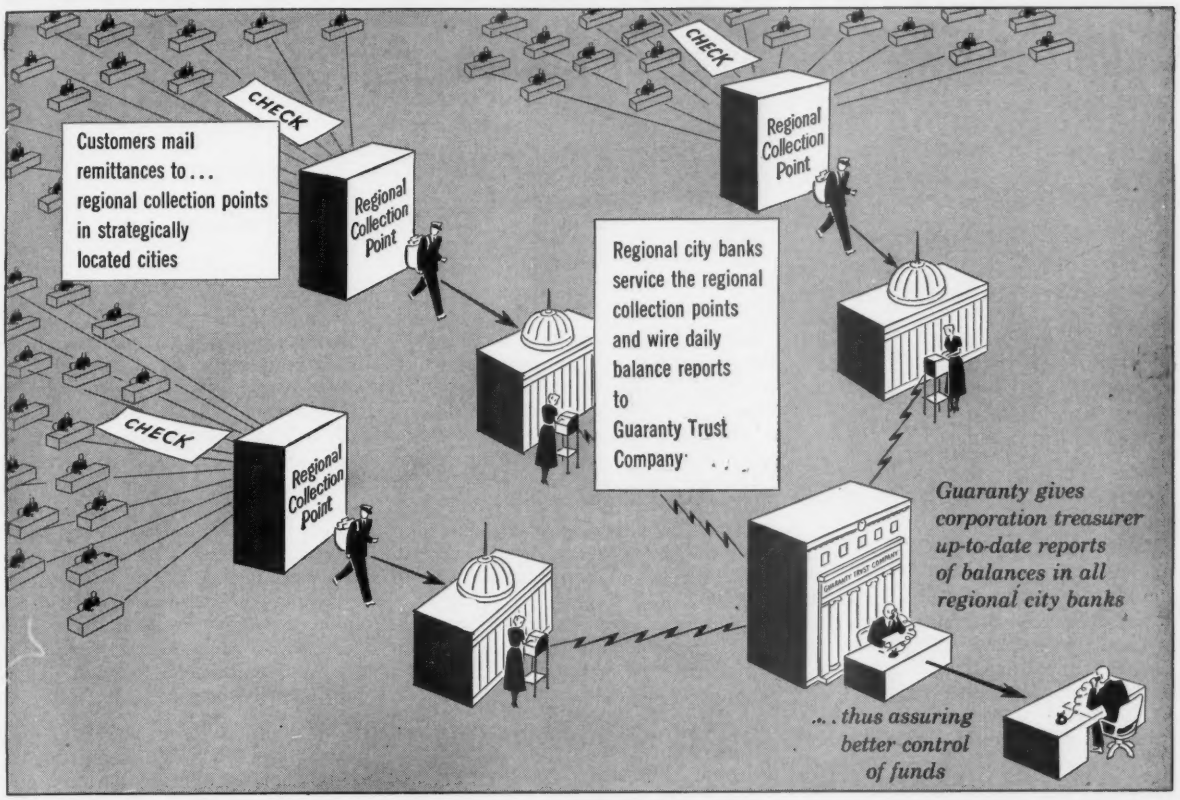
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Collection system saves time, reduces check "float" time, cuts down credit risks, and establishes better control of funds.

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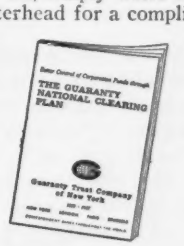

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Finding the Realistic Rate of Return

John A. Griswold

This article by Professor Griswold is the 18th in a series on business and economic subjects published by the Amos Tuck School of Business Administration, Dartmouth College, Hanover, N. H., under a grant from the Alfred P. Sloan Foundation and is reprinted with permission of the editor, Professor Robert S. Burger.

WISE CAPITAL-BUDGET decisions are of the utmost importance to both the nation and the company making them: to the nation because they give it a modern, efficient and complete industrial plant, to the company because they help it keep its place in our dynamic domestic economy.

Granted, capital-budget decisions based on hunches or partial understanding have often been profitable in the past. But the margin for error is vanishing. Technical developments arising from wartime and postwar research have brought about almost an industrial revolution since World War II. Current industrial research programs should bring even greater advances in the next 15 years.

On these advances will be based tomorrow's prosperity—a prosperity in which participation will *not* be automatic. To share in it, the average company will have to be willing to adopt, and even anticipate, developing techniques; to accept profitable new products and methods; in short, to make the right capital-budget decisions. Refusal to adopt a sound capital-expenditure program, or inability to decide wisely, will drive a company to oblivion.

One of the essentials of a sound program is a sound method of determining rate of return on a capital investment. To be sound, a method must:

1. Consider the cost of a project, the earnings expected from it and the length of its life.
2. Recognize that a sum of money to be received at some future time is worth less than the same sum received today.
3. Be able to translate a future sum into its equivalent present value.

At least two methods—the capitalization method and the discount method—meet these tests. (The discount method is known also as present-worth method, future-value method, discounted cash flow, profitability index, investor's method. The capital-recovery-factor method, which may be used only when returns remain constant from year to year, as in the case of an annuity, is a special adaptation of the discount method.) Since the capitalization and discount methods give the same results, we need concern ourselves with only one of them. We have chosen to deal with the discount method.

At this point let us stress that it is not our purpose to *prove* the discount method is sound. Its soundness *has been proved;* the proof is available elsewhere. We have four other purposes:

1. To bring it to the attention of any who may not already know about it.
2. To show its difficulty has been greatly exaggerated—that it is less difficult even than it appears at first glance.
3. To illustrate its use in several hypothetical capital-budgeting problems.
4. To prove the popular so-called short-cut methods are *not* sound.

We shall explain the discount method first.

THE DISCOUNT METHOD

Its equation may be expressed as:

The rate of return on a project is the rate at which the sum of the stream of after-tax earnings, discounted yearly according to present worth, equals the project's cost.

This may sound somewhat complicated, but our illustration will show that its application is relatively easy. Before we illustrate, however, some of the terms require elaboration.

Earnings: As used in this equation, this term represents the sum of:

1. Profits—money that will be brought

(Continued on page 482)

JOHN A. GRISWOLD, professor of Finance at Amos Tuck School of Business Administration, Dartmouth College, Hanover, N. H., has been an analyst with the Investment Analysis Bureau of St. Louis; served three years with the Army Air Force; been an instructor, Graduate School of Credit and Financial Management; and has frequently served as discussion leader for AMA seminars on Capital Budgeting. Dr. Griswold is author of a history of the Federal Reserve Bank of Chicago and Sloan Fund's "Cash Flow through a Business" and "Financing Business Expansion."

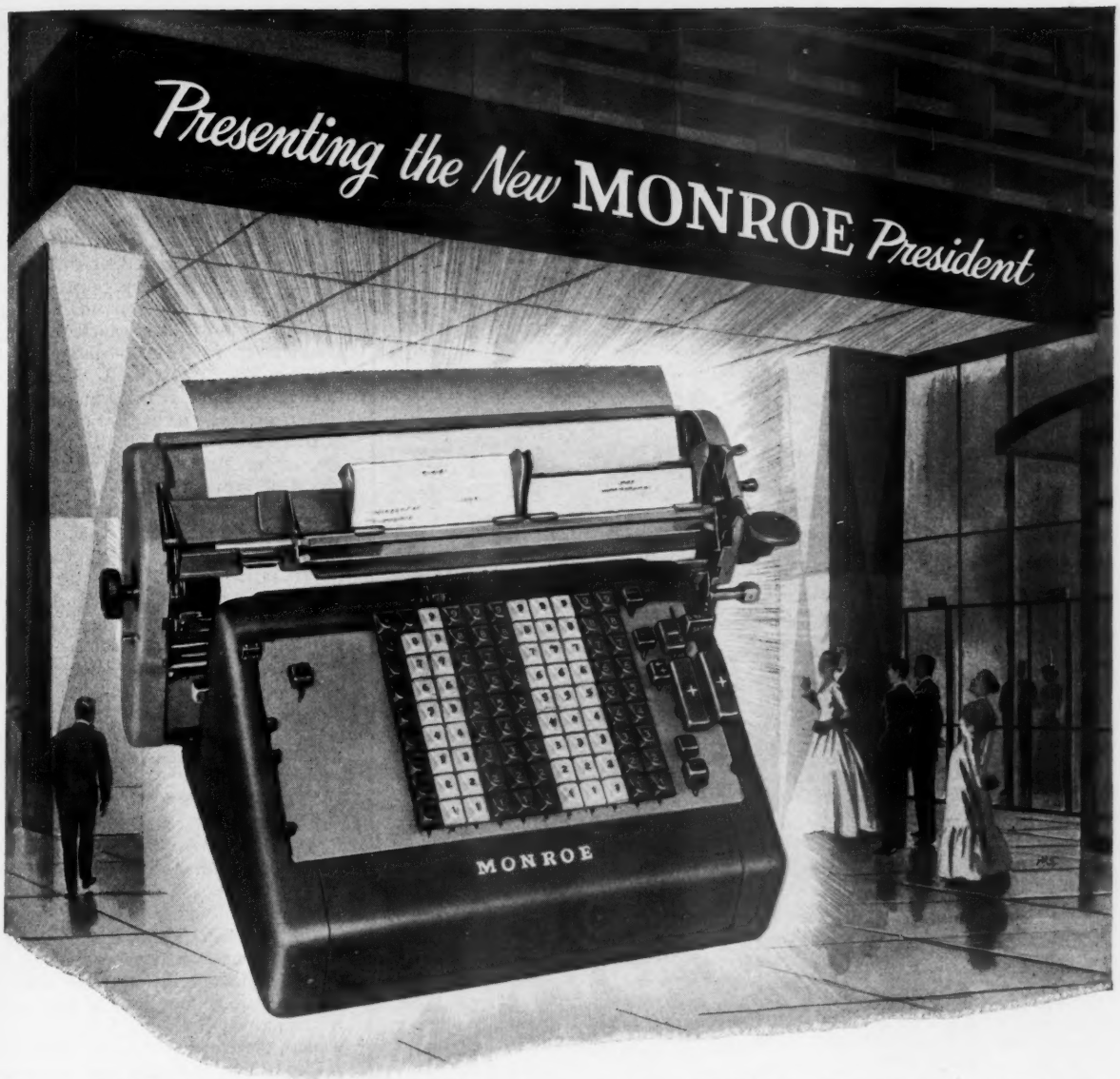

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TABLE 1

Hypothetical Projects Under Consideration for Development by the X Corporation
(000 omitted in all dollar totals)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Project's life in years	5	5	10	19	8	15	5	12	10	20	3	5	5	6
Cost	$1,000	$1,000	$1,000	$ 8,500	$3,200	$15,000	$500	$7,000	$9,000	$5,000	$400	$510	$6,000	$5,000
Average yearly earnings before taxes	$ 400	$1,000	$ 450	$11,720	$ 825	$ 9,000	$160	$6,300	$8,640	$3,800	$160	$220	$1,650	$2,260
Stream of earnings after taxes:														
1	250	300	250	100	500	1,250	100	100	200	100	150	100	3,000	2,000
2	340	800	400	500	550	2,000	140	2,000	1,000	200	200	400	2,000	2,000
3	340	800	400	1,000	650	3,000	160	3,000	1,000	300	81	200	1,000	2,000
4	350	700	400	3,000	650	5,000	150	5,000	3,000	400		50	500	2,000
5	210	400	350	5,000	650	6,000	100	5,000	9,000	1,000		50	500	1,000
6			300	7,000	650	7,000		5,000	9,000	2,000				200
7			300	8,000	600	8,000		5,000	8,000	3,000				
8			250	9,000	550	8,000		5,000	8,000	3,000				
9			200	9,000		8,000		5,000	8,000	5,000				
10			150	9,000		6,000		4,000	500	5,100				
11				9,000		6,000		3,000		5,000				
12				9,000		5,000		900		5,000				
13				9,000		4,000				4,000				
14				8,000		4,000				3,000				
15				8,000		2,250				1,000				
16				7,000						1,000				
17				6,000						500				
18				5,000						200				
19				3,000						100				
20										100				
Rates of return by:														
Cash Payback	31.2%	53.3%	34.8%	21.0%	18.8%	21.6%	27.2%	27.9%	22.6%	15.8%	38.2%	48.8%	33.3%	40.0%
Average Payback	20.0%	50.0%	22.5%	69.0%	12.9%	30.0%	16.0%	45.0%	48.0%	38.0%	20.0%	21.6%	13.7%	22.6%
Average Investment	20.0%	80.0%	35.0%	132.6%	13.3%	53.3%	12.0%	87.7%	86.0%	71.0%	6.7%	23.0%	7.5%	28.5%
Discount Method	17.4%	50.9%	32.5%	31.7%	8.9%	25.5%	11.0%	35.0%	27.1%	23.7%	6.1%	24.8%	10.4%	27.8%

into the business if the project under consideration is adopted; and

2. Savings—money, which otherwise would have been lost to the business, that will be retained as a result of the project.

Stream of Earnings: This is the estimated year-by-year return before depreciation and taxes, minus the taxes.

"Discounted yearly according to present worth": The important thing about present worth is that it is not a self-sufficient, independent concept; it exists only in conjunction with a specific interest rate. The sum of $100-a-year-from-today, for example, has no present worth. Discounted at various rates of interest, it has various present worths.

The factors by which discounted values can be calculated are available in tables. One such table, from which we have made all the present-worth calculations in this paper—and which is detailed enough for virtually any real-life situation—is shown as *Exhibit A.* It must be stressed, however, that our table is *not* the standard table found in most textbooks. The factors in the standard table have the effect of discounting only once a year, at year's end. Our table is modified to center discounting in each year. Since returns from a project are likely to come in continuously through the 12 months of any year, centered discounting generally gives a more realistic picture.

We shall now compute the rate of return, as shown by the discount method, for Project A in *Table 1.* To do this we shall draw up a second table, which appears as *Table 2.* If this were a blackboard demonstration, we should fill in the steps one at a time, explaining each as we reached it; this procedure would be the easiest to follow. Lack of space makes it impractical here, but we can perhaps achieve more or less the same effect if the reader will try to look at the various steps only as we call attention to them.

The top of *Table 2* and the first three columns are self-explanatory, and Column 4 is merely Column 2 minus Column 3.

But note now that in Columns 5 and 6 the stream-of-earnings figures have been discounted at 15 per cent. Where did we get 15 per cent? Essentially it represents no more than a guess, because this phase of the operation is essentially by trial and error. But the guess may have had some basis. For example, we might—in the light of other facts to be pointed out later—first have figured the rate of return by one of the short cuts.

Forget that for the moment, however: Having guessed 15 per cent, we find the factor for each year in the present-worth table *(Exhibit A)* and write it in Column 5. Each line of Column 6 is simply Column 4 multiplied by Column 5 of the same line.

Having finished our line-by-line compu-

EXHIBIT A

PRESENT-WORTH TABLES
(Modified to Center Discounting in Each Year)

Year in Which Dollar Will Be Received	*Present Worth of $1.00 If the Yield Or Discount Rate Is:*												
	3%	6%	9%	12%	15%	18%	21%	24%	27%	30%	40%	50%	60%
1	.985	.971	.956	.942	.929	.915	.902	.889	.876	.864	.824	.787	.752
2	.956	.914	.874	.836	.799	.764	.731	.699	.669	.640	.553	.477	.413
3	.928	.861	.799	.741	.688	.639	.593	.550	.511	.474	.370	.290	.227
4	.900	.811	.730	.657	.592	.533	.480	.433	.390	.351	.248	.176	.124
5	.874	.764	.667	.583	.510	.446	.389	.340	.298	.260	.166	.107	.068
6	.848	.719	.610	.517	.439	.372	.316	.268	.227	.193	.112	.065	.037
7	.823	.677	.557	.459	.378	.311	.256	.211	.173	.143	.075	.039	.021
8	.799	.638	.509	.407	.325	.260	.207	.166	.132	.106	.050	.024	.011
9	.775	.601	.466	.361	.280	.217	.168	.130	.101	.078	.034	.014	.006
10	.752	.566	.425	.320	.241	.181	.136	.103	.077	.058	.023	.009	.003
11	.730	.533	.389	.284	.207	.151	.111	.081	.059	.043	.015	.005	.002
12	.708	.502	.355	.252	.178	.126	.090	.063	.045	.032	.010	.003	.001
13	.687	.472	.325	.223	.154	.106	.073	.050	.034	.024	.007	.002	.001
14	.667	.445	.297	.198	.132	.088	.059	.039	.026	.018	.005	.001	—
15	.647	.419	.271	.176	.114	.074	.048	.031	.020	.013	.003	.001	—
16	.628	.395	.248	.156	.098	.061	.039	.024	.015	.010	.002	—	—
17	.610	.372	.227	.138	.084	.051	.031	.019	.012	.007	.001	—	—
18	.592	.350	.207	.123	.072	.043	.025	.015	.009	.005	.001	—	—
19	.574	.330	.189	.109	.062	.036	.021	.012	.007	.004	.001	—	—
20	.557	.310	.173	.096	.054	.030	.017	.009	.005	.003	—	—	—
30	.413	.170	.070	.029	.012	.005	.002	.001	—	—	—	—	—
40	.306	.093	.029	.009	.003	.001	—	—	—	—	—	—	—
50	.226	.051	.012	.003	.001	—	—	—	—	—	—	—	—

tations, we total Column 6. The total is more than the project's cost. *This means we have not discounted heavily enough;* our answer will be more than 15 per cent.

So we repeat the Columns-5-and-6 operation in Columns 7 and 8, substituting 18 per cent for 15. Our new total is less than the project's cost. *This means we have discounted too heavily;* our answer is less than 18 per cent.

To find it more exactly we *interpolate.* That is:

We subtract the smaller total from the larger:

$$\$1,052,130 - \$985,980 = \$66,150$$

We subtract the project's cost from the larger total:

$$\$1,052,130 - \$1,000,000 = \$52,130$$

We divide the second difference by the first:

$$\frac{52,130}{66,150} = .79$$

We multiply the last figure by the difference between 15 and 18 per cent:

$$.79 \times 3\% = 2.4\%$$

We add 2.4 per cent to the smaller of the two estimated rates:

$$15\% + 2.4\% = 17.4\%$$

And that is our rate of return. (We could have interpolated equally well from the other end—that is, down from 18 per cent instead of up from 15. The answer is the same in either case.)

TABLE 2

Project A
Cost: $1,000,000 Life: Five Years

Column 1	*Column 2*	*Column 3*	*Column 4*	*Column 5*	*Column 6*	*Column 7*	*Column 8*
				15%		*18%*	
Year	*Earnings Before Depreciation and Taxes**	*Taxes**	*Stream of After-Tax Earnings*	*Factor*	*Discounted Value*	*Factor*	*Discounted Value*
1	$300,000	$ 50,000	$250,000	.929	$232,250	.915	$228,750
2	480,000	140,000	340,000	.799	271,660	.764	259,760
3	480,000	140,000	340,000	.688	233,920	.639	217,260
4	500,000	150,000	350,000	.592	207,200	.533	186,550
5	220,000	10,000	210,000	.510	107,100	.446	93,660
					$1,052,130		$985,980

* Not shown in Table 1

FLEXIBILITY OF THE DISCOUNT METHOD

Besides being sound, the discount method has the advantage of great flexibility. For instance, while we chose in *Table 2* to express Project A's depreciation on a straight-line basis, we need not have; this method lets us express depreciation however we think best. The short cuts, as we shall see, permit no such choice.

The discount method lets us apply any predicted change in tax rates at the appropriate point in the stream of earnings. The short cuts do not.

The discount method can reflect costs that arise during a project's development period. In our examples, each project began to produce profits at once. This is rarely the case. A complex project may return no profits for several years, and the money required to put it into operation might meanwhile have been used very profitably elsewhere. The discount method lets us take this lag into account. To illustrate:

Suppose a project, instead of requiring a single-year outlay of $1,000,000, requires outlays of $800,000 one year and $200,000 the next, and suppose it returns its first profits the second year. If our cost-of-capital is 20 per cent, we add 20 per cent compound interest to the cash in-

vested, getting a much more realistic cost-of-project of about $1,340,000. We then figure the rate of return on the $1,340,000 rather than the $1,000,000.

This last advantage is one that the short cuts theoretically could share. In practice, however, they do not, because the additional computations tend to destroy the chief argument for their existence: their ease of calculation.

THE SHORT-CUT METHODS

Because the short cuts, like the discount method, have various names, we shall have to identify those we describe by their equations. The most common are:

Cash Payback: In this method, estimated after-tax income is totaled, year by year, until its sum equals the original outlay for a project. The reciprocal of the number of years—that is, one divided by the number of years—is the supposed rate of return.

To illustrate: Since the capital for Project A is recovered in 3 1/5, or 3.2, years, its supposed rate of return is 1/3.2, or 31.2 per cent.

Average Payback: The supposed rate of return is the estimated average annual income before depreciation and taxes divided by twice the project's cost.

Thus the rate of return for Project A would be $400,000 divided by $2,000,000, or 20 per cent.

Average Investment: The estimated average annual income before depreciation and taxes divided by the project's cost, minus the reciprocal of the project's life, is the supposed rate of return.

Thus the rate of return for Project A would be

$$\frac{\$400{,}000}{\$1{,}000{,}000} - \frac{1}{5}$$

or 20 per cent.

Let us see now how each of the three gives unrealistic results, and why.

CASH PAYBACK

First, this method overvalues projects in which maximum returns come early, undervalues those whose maximum returns come late. Second, it overvalues short-lived projects, undervalues long-lived ones. Why?

Basically because its equation is an assumption based on a confusion: the confusion of capital recovery with income. The *payback period* concept, on which it is based, is perfectly sound—but its only proper function is to show how many years will be needed to recover an investment. Granted, quick recovery of an investment is by no means undesirable; the discount method, too, puts a premium on it. But capital recovery is *not* the same as income.

Consequently any resemblance between rate of return as shown by the cash payback method and the valid rate of return is almost coincidental.

We can illustrate this with any of the 14 projects; let us choose L. Because capital for L is recovered in about two years, *and for no other reason,* its rate of return, according to this method, is 50 per cent. The fact that its stream of earnings falls sharply after Year 2 is disregarded; a complete cessation of earnings after Year 2 would also have been disregarded; so would a jump in earnings, after Year 2, to millions of dollars annually. In any of these cases—or in any other case, provided only capital is recovered in two years—the rate of return, by this method, is 50 per cent.

Since all it measures is the speed with which capital is recovered, and since capital must be recovered quickly, if at all, in a short-lived project, it overvalues short-lived projects; and since it covers only the period during which capital is being recovered, it undervalues projects in which maximum returns come late.

AVERAGE PAYBACK

First, average payback tends generally to overvalue. (The average rate of return for the 14 projects in *Table 1* is 30.7 per cent according to average payback, 23.6 per cent according to the discount method.) This is chiefly a result of its failure to discount.

Second, it especially overvalues projects in which maximum returns come late. The key to why it does this is the word "average" in its name; it holds, in effect, that *n* dollars earned any time equal *n* dollars earned any other time. This is simply not true; the sooner money is earned or freed, the sooner it may be put to new productive use.

However, this is also a "payback" method, based, like cash payback, on misuse of the payback period concept. Like cash payback, it overstresses mere recovery of investment. As a result, it has still a third fault: Like cash payback, it overvalues short-lived projects.

In spite of all this, it has undervalued three of the 14 projects: B, C and L. The reason:

Its equation provides for doubling the cost of a project; this tends to nullify, to some extent, the inflationary effect of its failure to discount. But the deflationary effect is *averaged,* while discounting would not have been. Consequently, the failure to discount may be more than neutralized when its effect would have been comparatively small—as in the case of a project whose life extended well beyond the period of its maximum earnings.

(Continued on page 514)

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Analysis and Control of a Cash Flow System

Martin N. Kellogg

How to increase the rate at which cash is made available

IN THE PAST FEW YEARS and to an increasing extent in the recent period due to increasingly tight money supplies, management interest has been focused upon means to better utilize the large amounts of cash which flow through the business process. One very important phase is concerned with increasing the rate at which cash is made available through business operations. For example, a company with monthly receipts of $6 million has the opportunity to recover about $1,000 per year in interest (at 6% per year) for every day it can make that cash available for business use.

Recently this problem was studied for a large company with average monthly billings of $60 million. Indications were that although it is practical to expect receipt of cash within ten days of performance of service, in actual practice it is more likely an average of 30 days. These 20 days of unproductive use of working capital are worth about $200,000 per year in interest (at 6% per year). Even at the low rate of three per cent per year the amount would be about $100,000 per year.

From the above remarks the reason for management interest in this problem and its solution is obvious, and a practical technique will have extensive implications and value. Therefore, the following analysis of the problem and technique of solution have been developed in answer to this need.

THE CASH FLOW PROBLEM

The incoming cash flow cycle can be broken into four processes which are:

Process	*Controlling Dates*
	Date service is commenced.
1. Performance of Service:	
	Date service is completed.
2. Billing:	
	Date bill is issued.
3. Collection:	
	Date bill is collected.
4. Banking:	
	Date cash is deposited.

The velocity of incoming cash flow can be increased only to the extent that this cycle is shortened in time, but to achieve this, positive control over the above listed dates must be maintained.

Investigations disclosed that positive control over the incoming cash flow is not achieved with present systems. However, this was only a subjective evaluation with the exception of one minor subprocess (miscellaneous collections) for which testing disclosed that for 35% of the items the elapsed time between completion of service and bill issuance dates was between eight and 24 weeks. The problems in obtaining a quantitative evaluation of the lag in cash flow were:

1. The extremely large volume of items involved (estimated bills originated by collection points were 244,000 per month), which prohibited anything but a small sample.
2. The necessity for first describing the cash flow system in order to determine the exact nature of the problem as to areas of responsibilities and specific problems involved in each area.
3. The necessity for first determining and describing the control devices which are relied upon for regulation of each area.

Upon completion of items two and three above, the remaining problem is: *How can this large volume of data be evaluated in order to objectively verify the need for a more efficient control system for cash flow?*

If an objective verification is accomplished and indicates a need for increased controls, then a second problem arises: *How can a positive control system be established?*

EVALUATING CASH FLOW VELOCITY BY STATISTICAL SAMPLING

A very clear-cut method of evaluating the necessity for increased control of cash flow is to describe for each process of the cycle a time period which is desirable under an efficient and controlled system. This time period would be compared to the time actually realized in current practice, and if the difference were significant, it would be concluded that the current system was not efficiently controlled. Conversely, if the difference were not significant, the current system would be accepted, and further work would be discontinued.

The above reference to a time period

(Continued on page 488)

MARTIN N. KELLOGG is a consultant in Management Controls (Operations Research, computer applications and general systems studies) for Peat, Marwick, Mitchell & Co., Chicago, Ill. Prior to this he had a variety of experience in industrial engineering, industrial systems development and construction management. At the University of Minnesota, where he assisted in teaching quality control and other industrial subjects, he received a Bachelor of Industrial Engineering, a Bachelor of Business Administration, and a Master of Arts (accounting and statistics).

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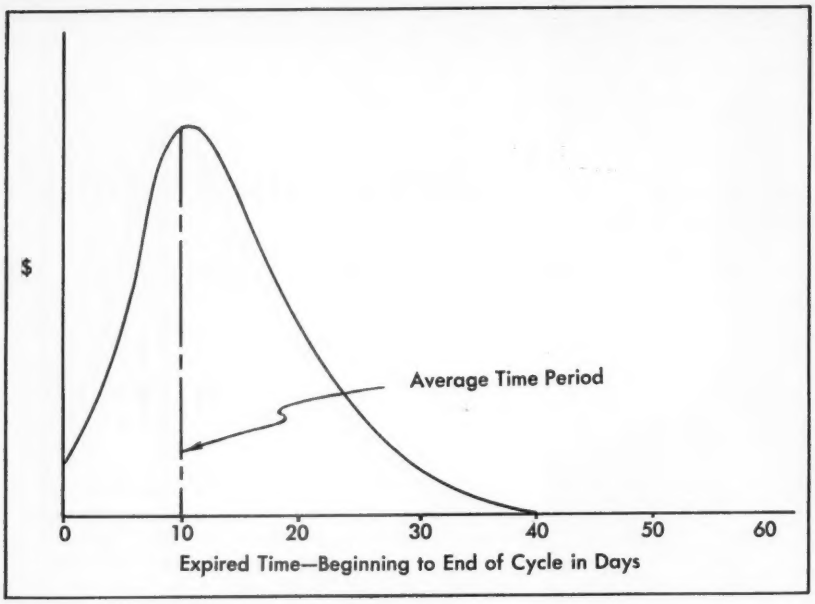


EXAMPLE I
Desirable Distribution of Cash Flow

does not mean a fixed period. For any such system the time period varies from item to item generating a distribution of time periods. *Examples I* and *II* show two distributions. *Example I* illustrates a desirable cash flow cycle distribution with an average completion period of ten days (weighted by dollar volume). *Example II* illustrates an undesirable distribution with an average completion period of 30 days.

At present it is not known whether *Example I* or *Example II* (or some other distribution not shown) correctly pictures the actual cash flow distribution. The purpose of a sampling analysis is to make a correct discernment between two levels. This program may be simply stated as follows:

1. Establish a statement to be tested. (i.e. the average elapsed time of the current system is the same as the desirable average elapsed time as shown in *Example I.*)

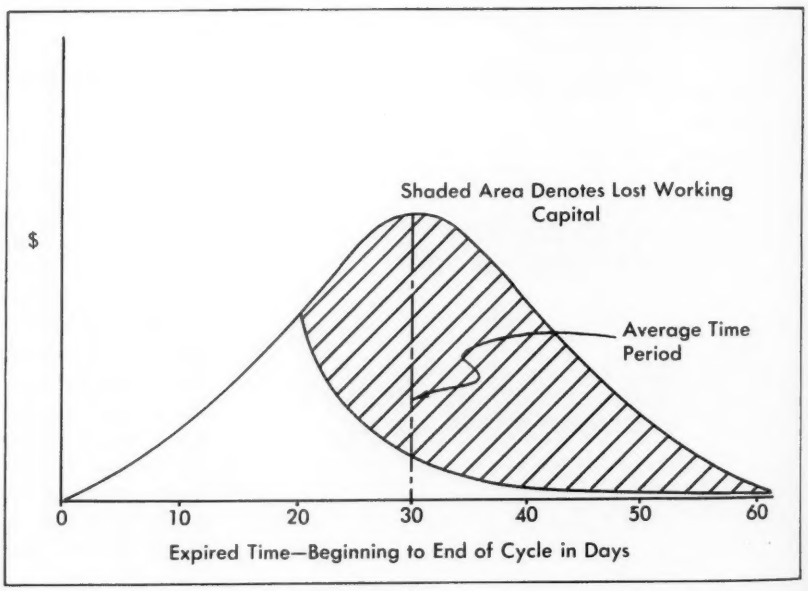
2. Determine the risk level. (i.e. what chance of an erroneous conclusion is acceptable?) This can be determined by balancing the costs of avoiding an erroneous conclusion against the cost resulting from actions based on erroneous thinking.

3. Determine the required sample size. This would depend on the choice for item two above, but preliminary analysis indicates that a sample of 600 items from any one process would give very reliable results.* This would apply to the 244,000 items per month originated by collection points.

4. Accomplish taking of sample group(s).

5. Determine confidence interval around sample mean.

6. Compare confidence interval with desirable time period distribution. If the confidence interval includes the desirable average time (as illustrated in *Example III*), conclude that the current process is acceptable and no further control devices are needed. If the opposite is true (as illustrated in *Example IV*), then proceed to install effective control procedures.



EXAMPLE II
Undesirable Distribution of Cash Flow

In the preceding discussion, it was implied that sampling verification of the general process of billing by collection points will be conducted. It should be further pointed out that verification of many subprocesses will be desirable. This will indicate specific responsibilities and processes which require direct attention.

In all cases, process definitions will have to be clearly specified so that conclusions relate to specific areas of responsibility. This will then provide the necessary basis for a control system.

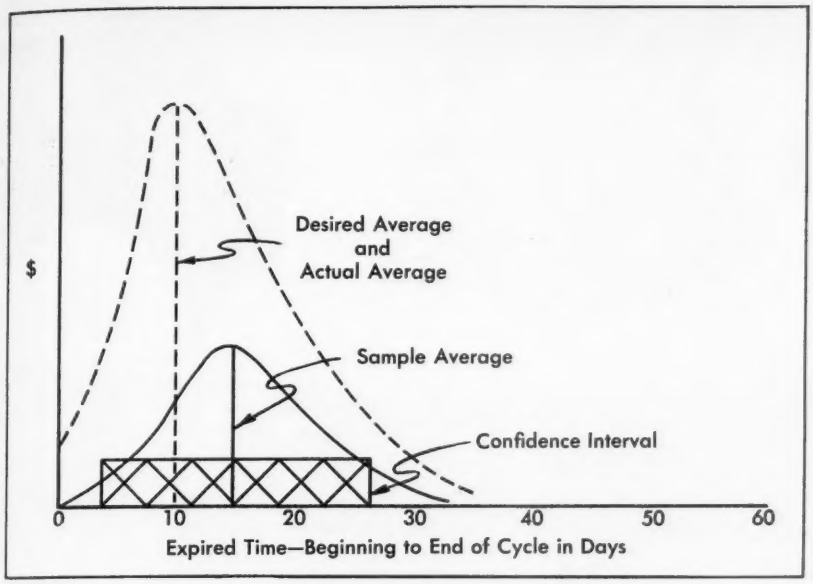
CONTROL OF CASH FLOW VELOCITY BY STATISTICAL SAMPLING

Assuming that the above test verifies the need for increased controls over the cash flow cycle, it is necessary to develop an efficient means of achieving this.

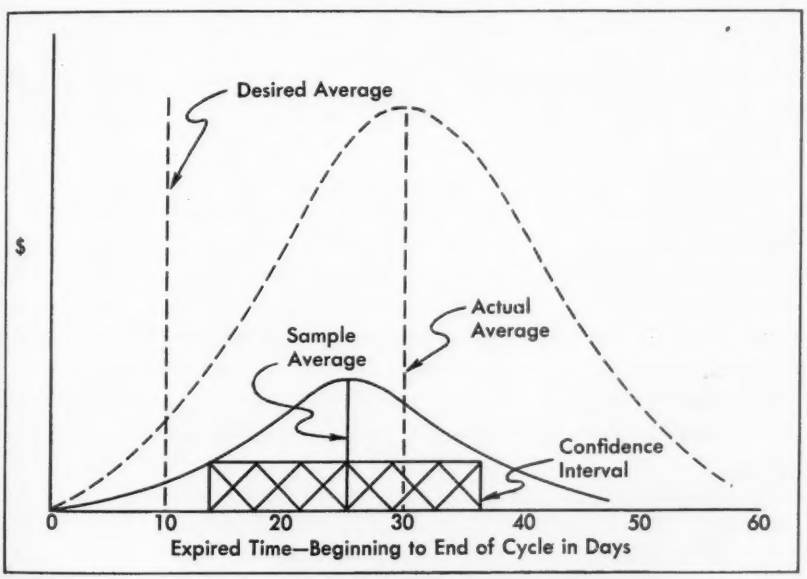
The situation can be readily analyzed as a problem in statistical quality control. That is, it is a continuous process for which the production is cash receipts. Production of high quality means a high velocity of cash flow (short time period). Production of low quality means a low velocity of cash flow (long time period).

The objective of control is to achieve the highest rate of quality commensurate with economical control costs. This balance can be achieved by statistical analysis and control. The techniques of statistical

* Further analysis of specific situations very likely would permit significant downward revisions on this figure which is based on the assumption of scant knowledge of the actual process distribution.



EXAMPLE III
Sample with Confidence Interval Including Desired Average
(Process Is Accepted)



EXAMPLE IV
Sample with Confidence Interval Not Including Desired Average
(Process Is Not Accepted)

quality control have long enjoyed practical acceptance, and since this particular situation presents no new technical problems, it is not necessary to provide a lengthy detailed discussion except for the following comments.

The initial verification information will be very useful in the first phases of establishing the control procedure. Specifically it will provide knowledge of the present process average and confidence intervals around which the control limits may be established. Tl.ese limits will be set at a lower level than the present in order to enforce improvements, but only at a level which will focus attention upon the worst offenses. Tightened control will not be attempted at once, but will be achieved through gradual pressures of stepped reduction in the acceptable time period as indicated in *Example V*.

Based upon daily sampling inspection of items of the process (sample size of four items), average values will be plotted on a control chart. Sample averages which

(Continued on page 505)

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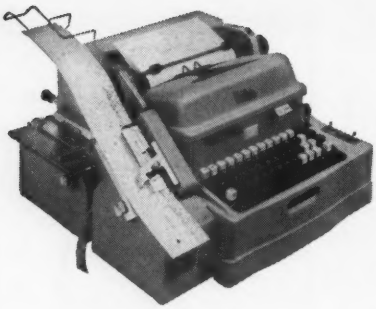

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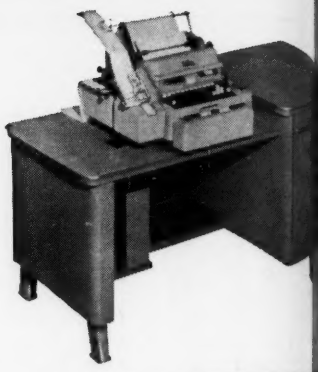

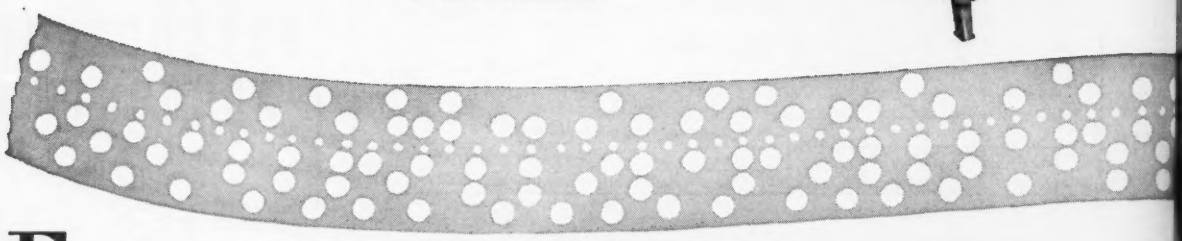

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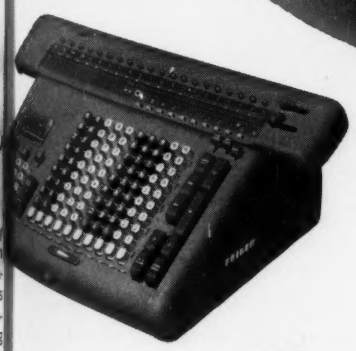

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In fiscal 1956, state and local governments took in more money, spent more money and went deeper in debt than ever before in history. Spending by these government units rose 7 per cent to more than $43 billion while revenue increased by 11 per cent to nearly $42 billion. The local units borrowed $7 billion and paid off $2.5 billion of previous indebtedness, leaving the total debt at $49 billion. Of the total debt, the states owed almost $13 billion, municipalities almost $17 billion, school districts $8.5 billion, while $10.5 billion was owed by counties, townships and special districts. Nearly 75 per cent of the general spending of state and local governments went for four major functions—education, highways, public welfare, and health and hospitals. During fiscal 56, taxes and other revenues collected directly by state and local governments amounted to $38.5 billion while more than $3 billion were received in federal grants.

Fringe Benefits

IRS has approved some 4,130 profit-sharing plans and 6,300 pension or annuity programs in the last two fiscal years. Fewer than one per cent being submitted to IRS wind up being rejected, but no figures are available for the number of times a plan may be referred back to the applying concerns until it is drafted in acceptable form.

Business Mergers

The number of major business mergers reported during the first six months of 1957 is 462, compared with 466 for the same period in 1956 according to the FTC. For the first half of 1955, a total of 404 mergers was recorded.

Income Tax

In determining earnings and profits available for dividends by an accrual method corporation, fraud penalties must be accrued for the year in which the return which gave rise to such penalties was filed; Revenue Ruling 107 is revoked.

Sick Pay

Wages received for a period of absence from work because of illness may constitute excludable "sick pay" even though a portion thereof is reflected on the employer's records as "vacation pay."

Antitrust Activity

Fines amounting to $696,750.00 were given to antitrust violators during the first six months of 1957. In this period 38 new antitrust cases were started compared with 29 in the first half of 1956 and 20 in the first half of 1953. Two of the new antitrust cases named labor unions.

Jobless Benefits Raised

Out-of-work benefits were raised in 24 states during this year, according to Commerce Clearing House. A state-by-state survey of current unemployment legislation reveals that 23 states boosted the maximum benefits available to the jobless by an average of $5 a week, and one state provided a larger total by increasing the duration of payments. The pay increases ranged from Wyoming's increase of $11 to Michigan's increase of $1 for dependents.

The Expanding Government

The Government's payroll for its civilian employes hit a record high during the fiscal year ended June 30, exceeding $11 billion for the first time. This total did not include $215 million the Government paid to foreign nationals not on the regular payroll. The Government's civilian payroll has shown an increase each year for the past three years and the new payroll total is about $500 million higher than the previous year.

State Income Tax Collections

Income tax collections in the states rose faster than sales tax revenue in fiscal 1957. Sales taxes, the states' biggest revenue producers in the postwar period, rose 8% against a 14% gain in individual taxes and an 11% increase in corporation income tax yields.

Small Business Loans

Loans to small firms made by SBA during fiscal 1957 totaled $159 million, an increase of 85 per cent over the $82 million loaned during fiscal 1956. In the recent fiscal year SBA approved 3,536 loans to small firms compared with 1,915 loans in fiscal 1956.

Pension and Welfare Funds

Five state governments have taken direct action to control the handling of employe pension and welfare funds, according to Commerce Clearing House. The fund trustees in New York, Washington, Wisconsin, California and Connecticut are now required to register and report details of collections and distributions involved in the management of such funds. The laws also contain provisions for state officials to conduct full examination of funds and their trustees. Enforcement powers are included, with penalties prescribed for violations.

The Millionaire Club

According to IRS, 201 taxpayers reported adjusted gross income of $1 million or more in 1954, compared with 145 in 1953 and a high of 219 in 1950. The figures do not include unrealized depreciation in value of securities or other property of individuals for the year.

—BENJAMIN R. MAKELA

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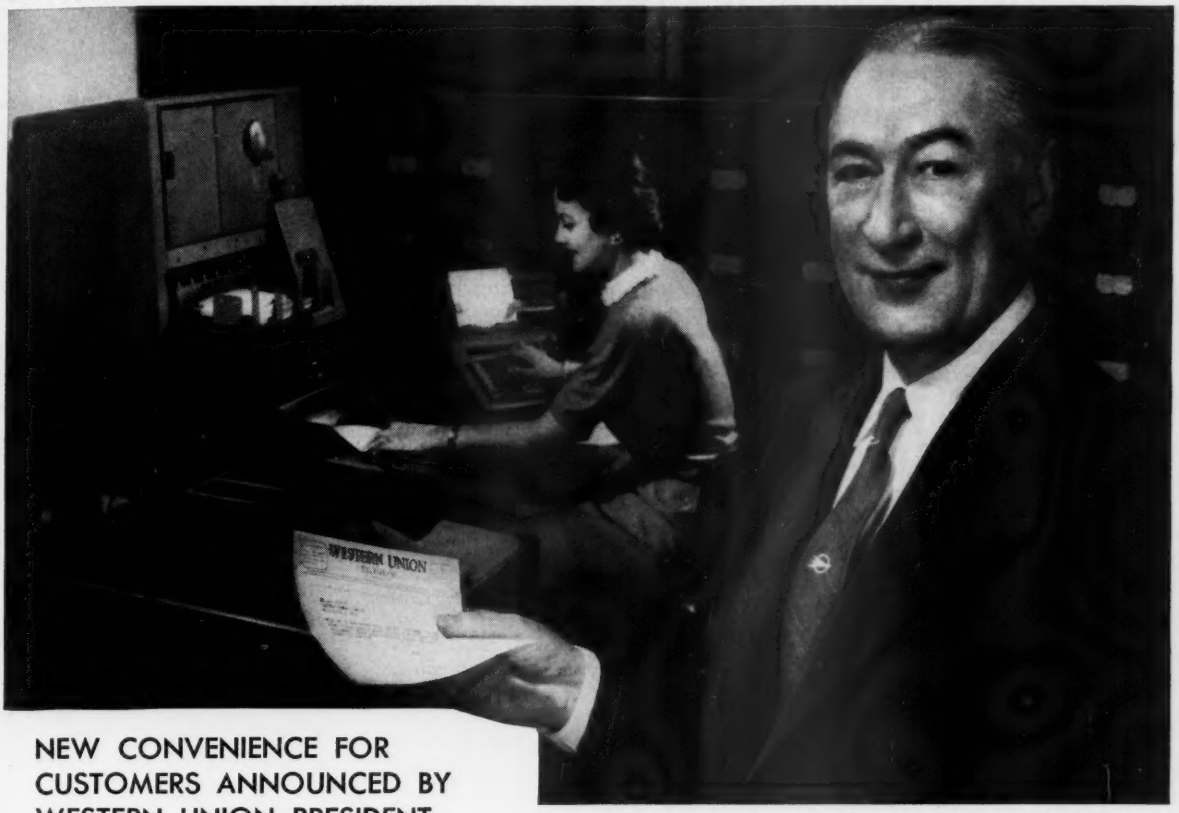

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Employe Appraisal and Development

Eugene T. Schauer

Fight the employe shortage by improving performance of current personnel

ANY PLAN for improvement of job performance must include the following simple practical steps:

1. Set up standards of performance
2. Measure or judge performance against such standards
3. Counsel with the employe and plan a program for improvement

Such measures are easy to state but they are much more difficult to implement. They involve a great deal of hard work. Setting up performance standards implies something in writing which can be used as a comparison. Written job descriptions, while not a complete answer, are a step in the direction of an objective standard.

Do you have anything objective against which you can measure or judge the performance of the employes under your supervision?

Do you have written job descriptions? If so, are they up to date?

These questions serve to emphasize a part of the problem, for unless an appraiser has a clear idea of what he expects of an employe, how can he hope to be objective in appraising that employe's performance? And how can he ever hope to get across to the employe what he expects unless he can state his expectations in a clear objective manner? If he can do that, he can put such expectations in writing.

The second step—measuring employe performance—involves an appraisal of employe performance, while the third step implies the necessity of a carefully prepared and skillfully handled interview together with a plan for improvement which must be followed-up in the future. If it could be assumed that the first two steps mentioned above were efficiently performed, the plan for improvement would still fail to accomplish its objective if the third step were not also efficiently carried out. Counseling with the employe relative to his performance is the pay-off in the entire plan. To omit that step or to perform it inefficiently is to nullify most of what has been done before. It can be compared to the performance of the football team that gains ground beautifully down to the ten-yard line and then either fumbles or bogs down and fails to score.

CRITERIA FOR A PLAN

In order to have a starting point suppose we assume that your company has decided to embark on a plan for improvement of employe performance and that the system of appraisal now in use does not seem to be getting the results desired.

What are some criteria to observe or guideposts to follow in designing that plan?

1. Decide that employe appraisal is necessary
2. Make preliminary plans
   a. Appreciate the necessity of a tailor-made system
   b. Determine what the purpose or aim shall be
   c. Decide who should make the appraisals
   d. Decide how often appraisals should be made
   e. Determine whether appraisers will have time to make appraisals
3. Develop the appraisal form itself
   a. Determine what type of form to use
   b. Determine what traits are to be measured or judged
   c. Decide whether some traits are to be given more weight than others
4. Train the appraisers
   a. Sell appraising to the appraisers
   b. Give instructions in techniques and skills needed to make appraisals
   c. Give instruction in techniques and skills needed in counseling

Let us now consider these criteria in detail. First, decide that appraisals are necessary. No system of appraisal can succeed unless it has the whole-hearted support of the people who do the appraising. In any organization there are some men who question the value of the entire idea. These men are honest and sincere. They have real doubts. Actually, though, appraisals are going to be made whether the company has a system or not.

The choice is not:

Shall we or shall we not appraise our employes?

The real choice is:

Shall we make appraisals on a hit or miss basis with each appraiser acting independently, or shall we appraise on an organized and systematic basis which attempts to secure a uniform approach to the problem and moves in the direction of obtaining fair and unbiased appraisals?

From another point of view, the periodic appraisal of personnel can be compared to the periodic inventory of the physical assets of a business. An inventory of materials is taken for granted, but an

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inventory of the human resources of a business is at least of equal importance.

The second criterion mentioned was: Make preliminary plans. Perhaps the most important one factor in this phase of the work is to appreciate fully the fact that an appraisal procedure cannot be secured by sending a requisition to the purchasing department. It cannot be bought. Neither can it be borrowed from someone else. It must be tailor-made to fit the problems peculiar to your organization, expressed in terms familiar to your people and developed by them. Too often we become so concerned with the particular form to use that the problems to be solved become secondary and the form itself becomes the end.

The next decision to be made is:

What shall be the aims and purposes of our appraisal procedure?

What do we wish to accomplish?

Different companies use their appraisal systems to try to achieve many different results. Surveys show that as many as ten or twelve aims have been set forth as being the purpose of appraisals. Some of these are:

1. To help in deciding who should be promoted or given a salary increase
2. To discover employe weaknesses as a basis for training
3. To uncover outstanding talents
4. To develop employe morale by creating confidence in management
5. To help in assigning work in accordance with ability
6. To stimulate people to improve
7. To serve as a basis for discharge

With so many purposes available, all of which seem to be quite important, it is very easy to fall into the error of trying to make the appraisal system become all things to all people and by a scattering of effort reduce the effectiveness of the whole. Concentrating effort in an attempt to accomplish only one or two objectives is a most important factor in determining the final results obtained.

The next two items in planning are:

Who shall make the appraisals? How often shall appraisals be made?

Regarding the first of these, three possibilities are available. Appraisals can be made by superiors, by subordinates or by equals. It is almost universal practice for appraisals to be made by superiors, frequently with a review by the next higher echelon of management. Such studies as have been made seem to indicate that people prefer to be appraised by superiors. This does not mean, however, that such is necessarily the best way for it to be done. Indeed, it is quite likely that an appraisal by one's equals or subordinates will more accurately reflect his real competence than will an appraisal made by his superior. Three reasons are advanced to support this belief.

First, a man's equals or subordinates are in much closer contact with what he does on an hour-by-hour and day-by-day basis than is his superior. Second, a man naturally tries to be at his best when his superior is present, while the equals and subordinates see him as he really is. Third, using equals and subordinates makes it possible to get a number of judgments, the average of which might be more reliable than a single opinion.

Regardless of these theoretical advantages, however, the fact remains that it is not the way most companies go about making appraisals. The general rule followed is to have the appraisal made by the person or persons who are in closest contact with the employe's work. Such studies as have been made seem to show that having the appraisal made by the employe's immediate supervisor with a review by the next higher level of supervision produces a more valid appraisal than do alternative plans.

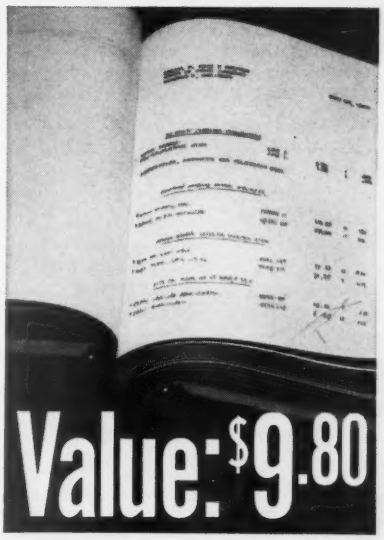
Frequency of appraisals is an individual company matter although the purpose of the appraisal may be the controlling factor. Appraisals can be made annually, semiannually or quarterly. They can all be made at one time or they can be staggered throughout the period. If the appraisal is tied to promotions or salary increases, employes will probably want more frequent appraisals. If promotions are at stake, it might be better to appraise all people at the same time. If, however, the purpose of the appraisal is employe improvement, less frequent appraisals are necessary. Most companies insist on more frequent appraisals for new employes, perhaps a three- or six-months' appraisal during the first year of service. At the other end of the scale is the problem of what to do about the man who has been on the job for many years or is nearing retirement. Will any useful purpose be served by having even an annual appraisal made in such cases?

The last point to consider in the preliminary planning is:

Will the appraisers have time to carry out the program?

It is mighty easy to say that appraising personnel is a most important supervisory function but the fact remains that to the busy supervisor, appraising employes is just one more demand for time on an already crowded schedule. The attitude of higher management is most important. If it will take an active interest in the appraisal procedure and give it unqualified support, not just lip-service, a sound basis will have been established. Also, there should be included in the procedure some plan for freeing appraisers of routine duties when the time to make appraisals comes around. Naturally, some place should be provided for the appraiser to sit down in privacy to perform the appraisal without interruptions.

(Continued on page 496)



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Employe Appraisal and Development *(Continued from p. 495)*

DEVELOPING A FORM

The next step after the planning is to develop the appraisal form itself. The type of form to use is the first decision to make. Three possibilities are available. First, the general trait scale. This usually involves a list of general traits such as "dependability, judgment, co-operation, initiative," etc. These traits are usually defined in some manner and the appraiser is asked to indicate on the scale the degree to which the employe possesses that trait. The scale may be graduated with numbers, e.g., from one to ten; or it may have a list of descriptive adjectives, such as "excellent," "good," etc. The second possibility is the behavior check list where a number of statements of specific activities involved in performing the job are given and the appraiser is asked to check whether the employe does them; or perhaps how well he does them. The third possibility is to rank the employes in order from "best" down to "poorest" either on over-all ability or on some defined characteristic. Still another possibility, which perhaps should not be called a form, is to request the appraiser to write a paragraph or two about the employe. If the appraisal is to be used administratively, probably the general trait scale or ranking method would be the better. But if the object is to secure something to serve as the basis for a constructive interview with the employe and is intended to improve performance, the check list would probably be superior.

The next step is to decide upon the traits to be measured. In practice the names and numbers of traits included on appraisal forms differ widely. Surveys reveal that a total of 35 supposedly different traits have been used. The greatest number on any one form was 19 and the smallest was four. The average was ten. How many traits to include cannot be decided arbitrarily. The best thought seems to tend toward fewer traits to be checked. In general it can be said that the traits to include are those which are required of a person doing the job on which performance is to be appraised. Since it is impracticable to develop a separate scale for each job, the most important traits common to many jobs will have to be selected. No trait should be selected for use unless it meets the tests of observability, distinguishability and is required on the job.

The last step is to decide whether some of the traits should be given greater weights than others. This is most frequently attempted by using numbers on the scale and having some traits appraised on a basis of from one to five, others from one to ten, etc. While this appears to be a neat way of weighting the traits, it just does not work out that way. The true weight of any trait is a mathematical problem in statistics which has no place in our discussion. Suffice to say that the weighting of traits is of doubtful value.

TRAINING THE APPRAISERS

The final criterion suggested was the need to train the appraisers. I think it is self-evident that if we have good supervisors who have a clear idea of what they are trying to do in making appraisals, we will secure improved appraisals. It is the man who makes the difference, not the tool with which he works. Good men with poor tools will still do a reasonably good job. With better tools, they will do a better job. Let us emphasize that the appraisal form and the system is the tool. It requires a capable man to use it to advantage.

Under the best of circumstances, appraising others is an extremely difficult job. Personal prejudice and bias are human weaknesses which even the finest of supervisors can possess and perhaps not be aware of. It is essential, therefore, that some sort of training be made available to acquaint supervisors with the more obvious difficulties and pitfalls to be avoided and some of the more obvious techniques to be followed. While no business will entrust a new man with an expensive piece of delicate machinery without at least showing him how to turn it on and off, there has been no hesitation in turning untrained and uninstructed supervisors loose to make appraisals.

One purpose of a training program should be to sell appraising to the appraisers. I think it would be a mistake to assume that this is not necessary. While there may be no active opposition to the idea, there may be considerable passive resistance which is the most difficult to overcome. Start at the top and work down. Top management must sincerely believe in and actively support the appraisal program. Signed directives are not enough. Management must demonstrate

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by actively participating in the program.

Next, bring the appraisers into the development of the procedure at the first stages. Insist upon their actually taking part in the development. Solicit opinions and ideas, discuss aims and objectives. Make the appraisers feel that the end product is partly their idea. Remember that keeping the appraisers sold is just as important as the original selling. Periodic refresher training is called for. Include evidence showing the benefits of appraisal both to the supervisor and the employe.

The other major purpose of appraisal training is to give instruction in the techniques and skills needed. Some points to be covered are:

1. The clarification of the aims and purposes of the appraisal. Make sure that the appraisers understand what is trying to be achieved and that they concur in such aims.
2. Give instruction in the meanings of the characteristics or traits which are to be evaluated. Merely to define a trait on the form itself is no guarantee that common understanding of its meaning has been obtained.
3. Give instruction on the meanings of the different gradations on the scale if a scale is used. Some appraisers grade consistently high; others consistently low. Exactly the same performance might be given widely different grades by different supervisors simply because each has a different idea of what the gradations mean.
4. Give instruction in the avoidance of some of the more common errors of appraisers. Some of these errors are:
   a. A lack of sufficient knowledge of the employe. The need to be appraisal-conscious throughout the entire period rather than just the week before the appraisal is due. The need to be on the lookout for evidence to justify the grade given the employe.
   b. Appraising on the basis of isolated cases. The tendency is to generalize that the isolated case is typical. At best such a tendency bases the entire appraisal on very limited objective evidence.
   c. Making the appraisal on one trait in the light of the appraisal already made on another trait. Or comparing of traits about which very little is known with the one on which something is known and appraising them alike.

(Continued on page 498)

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Employe Appraisal and Development

(Continued from page 497)

d. Appraising on the basis of a general impression.
e. Restricting the appraisal to a mere filling in of blanks or to a making of check marks in the spaces provided. No appraisal form can possibly give an adequate picture of an employe unless the appraiser makes full use of his imagination in giving additional information.
f. Allowing personal prejudice or bias, either conscious or unconscious, to color the appraisal.
g. A tendency to give friends high appraisals.
h. A reluctance to give low appraisals for fear that it will be a reflection on the appraiser.

5. Give some practice in appraising. Actually make an appraisal and then discuss it with other supervisors who have knowledge of the employe.
6. Give instruction in how to use and interpret the completed appraisal.

COUNSELING THE EMPLOYE

As was indicated earlier the use to which the information is put is of the utmost importance. Since the last step in employe improvement was stated as being "counseling with the employe," the post-appraisal interview becomes a most important step. Some good interviewers are born, but most of them are made. Study and training will go a long way toward making this step more effective. Unless the interview is skillfully conducted its possibilities for harm are almost as great as those for good. Training should include:

1. General principles to be observed
2. Pitfalls to be avoided
3. The object to be accomplished
4. The manner the interviewer should strive to acquire
5. The need of preparing for the interview
6. The need of allowing the employe to be prepared also
7. The need to have some plan for improvement in mind
8. Some techniques to be used in conducting the interview
9. The need to plan a follow-up program during the coming months

A TYPICAL CASE

So far my remarks have been general in nature. They have been an outline of how one might go about the development of a procedure for improving employe and supervisory performance. The rest of this discussion will be a description of what was actually done at one company to develop a better appraisal form. The check list on the form was developed in the following manner:

From the completed appraisals then on file, a list of descriptive statements was obtained. Then the supervisory force was called upon for assistance in expanding the list. A request for a list of ten such statements from each supervisor was requested and a flood of over 300 was returned. These statements were studied and edited into approximately 80 statements of which about half represented favorable and half unfavorable behavior. To the extent possible the statements were such as would differentiate between successful and unsuccessful performance. These statements were then submitted to the supervisory force—in this instance, only the 15 or 16 highest supervisors—in two lists, one favorable and one unfavorable, with a request that the 20 of each which was felt would be most beneficial be selected. Tabulation of the results of this vote produced the 40 statements now included on the check list on the appraisal form.

In selecting the 15 traits which appear on the back of the form, the desires of the appraisers as indicated on the questionnaire previously mentioned was allowed to govern. They were, however, arranged in two general groups and to the greatest extent possible were not limited to a single word. No attempt to define the traits was made. The grading of these traits in terms of "very superior" to "marginal" was selected because it seemed to come most closely to reflecting the desires of the appraisers themselves. However, two other columns were introduced to allow flexibility. Traits not applicable to a given employe or job or not observable during the period covered need not be graded.

There was almost unanimous agreement that the employe should be allowed to become acquainted with the new form before his first appraisal and interview. It was suggested by some that a copy of this form should be given to each employe so that he could become familiar with the type of behavior which the supervisory force considered favorable and unfavorable. There was also practically unanimous agreement that an employe should be notified some time in advance of the time his interview was coming up so that he could come to the interview as well prepared as the supervisor who would conduct it.

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Name		Date of Birth	Date Employed
Department	Section Division	Location	Date Assigned Present Job
Job Classification			Date This Report

CHECK LIST OF BEHAVIOR SAMPLES

Instructions: Please check as many of the samples of behavior listed here as you have observed in this employe since your last appraisal. If the particular sample you wish to check does not appear, insert it in the "Additional Comment" space below.

___ Has taken over the work of fellow workers at a critical time and handled it well

___ Has accepted increased duties and responsibilities as a result of changed requirements

___ Has handled a difficult problem involving another department or division with tact and diplomacy

___ Has shown a desire to learn by asking questions about things not thoroughly understood

___ Has learned more quickly than the usual employe with comparable background and training

___ Has readily admitted he was to blame when an error was discovered in his own work or in that of the men under him

___ Has written letters and reports which indicate above average ability to express himself in writing

___ Has readily passed on credit for successful results to others who had a part in the work

___ Has successfully analyzed an unusually difficult problem

___ Has encouraged and guided new employes even when under heavy pressure himself

___ Has made a personal sacrifice in order to get the work completed

___ Has taken a formal training course in order to improve himself

___ Has taken over a new job and carried on without appreciable loss of efficiency

___ Has reorganized the work in his unit with a considerable saving in time

___ Has foreseen a difficult problem and prepared a proposal for its solution

___ Has been courteous and friendly with the people with whom he works

___ Has voluntarily done more than his assigned share of the work

___ Has been careful to keep his supervisor informed about the progress of his work

___ Has done a complete job on a difficult assignment without the necessity of close supervision

___ Has taken the initiative when it was proper for him to take it

___ Has had difficulty in deciding upon the better of two or more possible solutions to a problem

___ Has given a "snap" answer which was wrong when the means of obtaining the correct answer was available

___ Has refused to accept help from more experienced employes

___ Has shown a belligerent manner toward other employes

___ Has bothered other employes by talking too much

___ Has been lacking in tact in telephone conversations

___ Has proposed a change in the work but has been unable or unwilling to work out the details of the change

___ Has objected to being asked to perform duties that are not strictly the regular duties of his job

___ Has been resentful of criticism which was made in an effort to improve his performance

___ Has created friction and misunderstanding in his group

___ Has burdened himself with details which should have been delegated to others

___ Has "stretched out" a job to make it fit the time at his disposal

___ Has allowed himself to become upset by a change in the routine

___ Has exercised authority beyond the limits of his jurisdiction without first consulting his supervisor

___ Has experienced difficulty in writing instructions in a clear and definite manner

___ Has sought help on a problem he should have solved alone

___ Has sacrificed time for unnecessary accuracy

___ Has displayed a lack of confidence in himself

___ Has ignored suggestions for his own improvement

___ Has demonstrated indifference toward his work

Additional Comments:

See Reverse Side

A. PERFORMANCE ON THE JOB	Very Superior	Superior	Good	Fair	Marginal	Not Applicable	Not Observable
1. Knowledge of job							
2. Quality of work							
3. Quantity of work							
4. Work habits and attitude							
5. Ability to plan and organize work							
6. Responsiveness to change							
7. Ability as a teacher							
B. PERSONAL QUALITIES							
1. Physical condition							
2. Ability to get along with others							
3. Ability to plan and inspire activity of others							
4. Judgment and common sense							
5. Ability to learn							
6. Power of analysis							
7. Power of expression							
8. Initiative							

What is this person doing well?

What can this person do to improve?

Appraised by_____ Position_____ Date _____

Date appraisal discussed with employe_____

Results of such discussion

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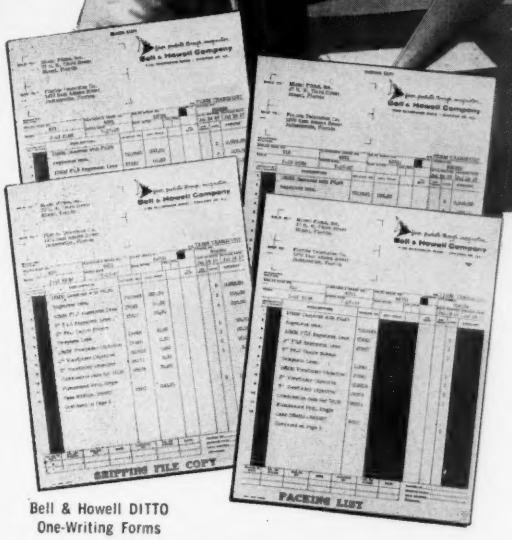

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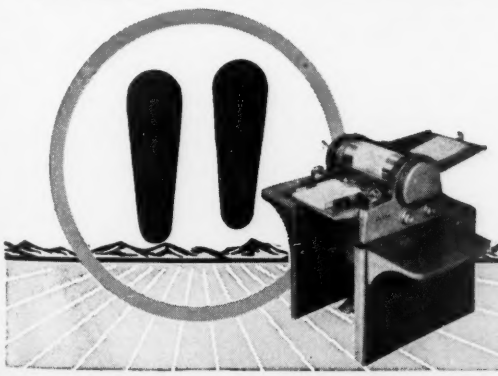

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Paging the New Books

MACHINE TOOL LEASING*

By J. L. Treynor and Richard F. Vancil

Reviewed by D. L. BRENNEN
Assistant Treasurer
Reed-Prentice Corporation
Worcester, Mass.

The authors, in approaching the subject of machine tool leasing after outlining the developments in the field of leasing machine tools, outline the advantages and disadvantages inherent in a leasing program pointing out that one of the advantages which create a demand for a leasing program is that the lessee is enabled to retain capital in a liquid form for alternate usages. This creates a major problem in deciding whether or not it is economically feasible to lease machinery. This reason, however, also creates one of the most serious problems in the consideration of this subject because it gives rise to the basic problem of establishing a desired earning rate which should be earned on the capital thus retained by not purchasing.

A second serious factor to be considered is the effect of income taxes and depreciation, taking into account accelerated depreciation which is now possible under the 1954 tax code.

The authors found that leasing agreements available for study followed definite principles—both where the manufacturer developed a leasing program, financing the transaction himself or financing the lease agreement by assignment to a financing company. Under this plan, the manufacturer makes a direct sale to a financial company, who, thereafter, deals with the lessee. There is a uniformity in the various lease agreements. As a general rule, the lessee is responsible for many costs such as property taxes, freight, transportation charges, costs of the preparation for shipment, also for insurance and the cost of servicing, repairing and maintaining the equipment.

The authors discovered that the most confusing and controversial subject in machine tool leasing is that of the effect of federal income taxes, where three major problems are involved—all of which have a serious effect on the desirability of leasing. These problems are:

1. The effect of the accelerated depreciated rates.
2. The tax status of lease agreements with an option to purchase.
3. The current deductibility of lease payments, particularly where the payments are on a declining scale.

The liberalization of the depreciated rates by the 1954 code decreased considerably the cost advantages of leasing.

A lease agreement with purchase option, it is pointed out, complicates the current tax status unless the purchase option closely approaches the market value of the equipment.

The authors note that there has been no definite decision or statement by the Internal Revenue Department on leases with declining payments as to how they will be treated by the Department.

To make a decision as to whether to buy or lease, a potential lessee must establish a desired earning rate to use in figuring the cost of leasing.

This desired earning rate is not the interest rate at which a company can borrow money, but should be the rate at which the money should be put to use as an investment with a given amount of risk, and which will permit the earning of a comparable profit. The desired earning rate is not the average earning rate of the company, although the average earning rate may be useful in determining a desired earning rate. The average earning rate does not always take into account the de-

* *Published by Management Analysis Center, Inc., 275 Newbury Street, Boston 16, Mass. $15.00.*

grees of risk of incentive investment opportunities. The desired earning rate will also not be the same for all companies because of the different factors involved.

A second factor which must be taken into account in determining the cost of leasing against buying is the present value of future dollars. This concept is simply a recognition of the fact that a dollar paid or received at some future date is worth less than a dollar paid or received today.

If a sound decision is to be made, the potential lessee must set a present value discount factor to determine the present value of future lease payments. As the authors pointed out, there is a discount rate at which the cost of buying and leasing are equal.

In considering the inherent advantages of leasing, it is pointed out that the lessor is in the manufacturing business, and that there is available to him, alternate investments of his earnings at rates of around 20% per year before taxes. A lessee can only hope to make money under a leasing plan if his desired earning rate is higher than the financing rate in the lease plan. It is not uncommon for financing institutions to charge approximately 12% interest on conditional sale contracts. A rate at least equal to this figure is certainly justified in view of the greater complications and risks involved of loaning money under a lease agreement.

It is to be recognized that the operation of a lease agreement is analogous to the transferring of available funds from one business to another. In other words, the lessor is investing in a new project with the lessee. This accomplishes two socially desirable objectives; namely, the lessor's money has been put into the hands of someone who is in position to invest it, and the lessee puts the money to work, earning income.

It also should be recognized that, under a lease agreement, the risk of obsolescence is shifted from the lessee to the lessor, who, undoubtedly, is in a better position to handle this particular problem as the lessor must become a professional in the proper disposing of used or obsolete equipment.

Because of the variable problems involved, the decision to lease can only be determined after a consideration of these factors by the lessee:

1. The desired earning rate on capital freed by leasing.
2. Methods and rate of depreciation which would be used if the leased equipment were purchased.
3. Number of years the lessee expects to keep the equipment under lease.
4. Income tax rates in effect during the life of the lease.
5. The market price at which the equipment can be sold at the termination of the lease.

(Continued on page 504)

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1. The amount and method of lease payments.
2. The amount of deposit, if any.
3. The penalty for early termination.
4. Minimum number of years for which the machine will be leased.
5. The income tax rates in effect during the life of the lease.
6. The market price at which the equipment can be sold at termination of the lease.

It is to be recognized that any of these factors may change the cost of leasing as compared with the cost of buying, and the various costs can only be determined by making an assumption on each of the variable factors. The lessee is also interested in the effect which any change in any of these assumptions will have on the costs in order to enable him to arrive at a decision.

In order to arrive at a decision, the potential purchaser or lessee must consider various alternatives possible; namely,

1. Buy or not to buy.
2. Lease or to buy.
3. Lease or purchase on conditional sale contract.
4. Lease or not to lease.

The factors and the tables which the authors of the book have established based on the various lease plans available enable a potential purchaser or lessee to arrive at a decision with much more accuracy than was heretofore possible, taking into account all the variable factors which will influence the decision.

The authors have done an excellent job in treating a very complex and difficult subject, and have established an excellent set of tables of "realization values" and "calculating the cost of leasing over buying" which should be of inestimable value to those charged with the responsibility of making a decision as to whether to buy or lease.

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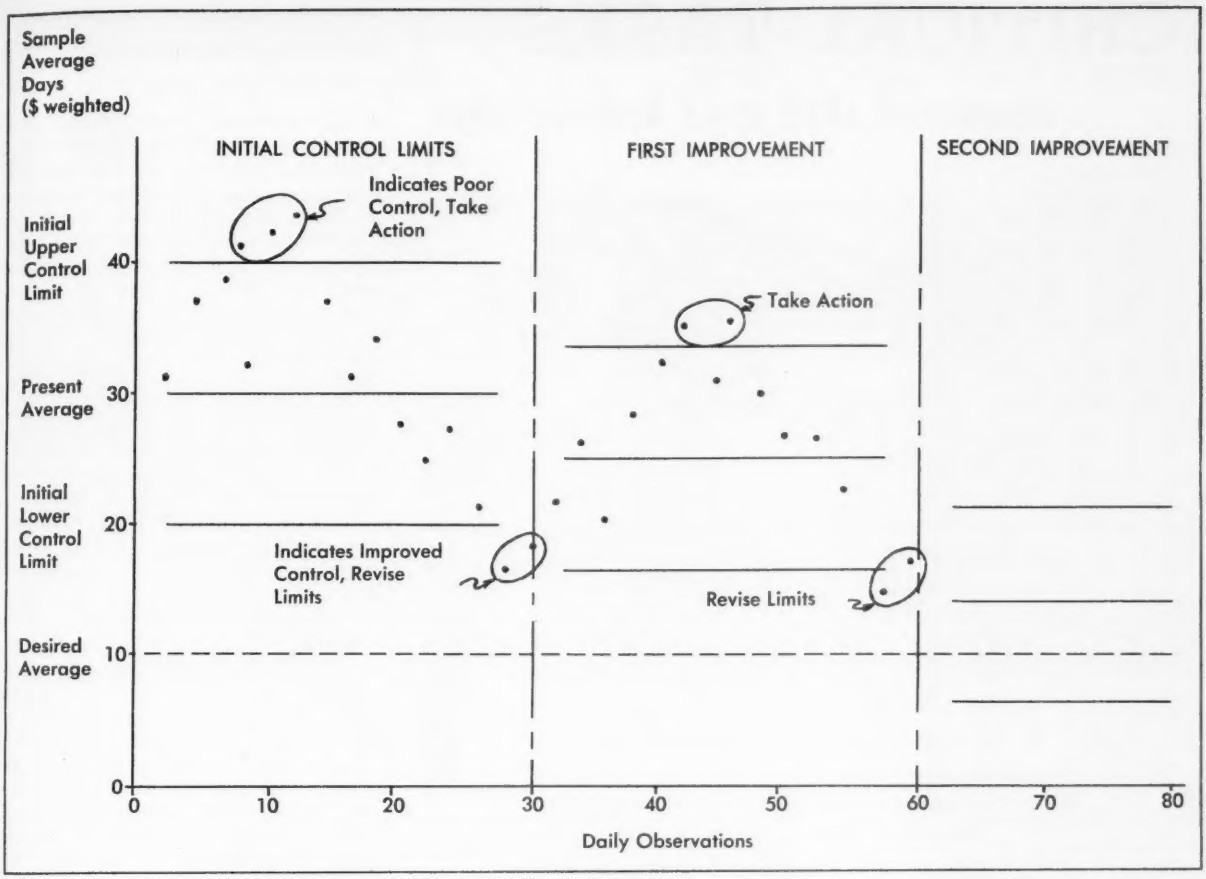

EXAMPLE V
Control Chart: Simulated Cash Flow Control

Analysis and Control of a Cash Flow System

(Continued from page 489)

are not within control limits indicate action must be taken. In the case of those samples plotting above the upper control limit administrative action would be required to reduce the time period. Those plotting below the lower control limit indicate an improvement in the process which is translated into a reduction of the control limits.

Through these pressures and improvements, the time cycle will be reduced to its practical minimum. At this point inspection will continue as a control device to prevent the system going back to its former state, but sampling can be reduced by significant proportions.

ADVANTAGES OF THE STATISTICAL ANALYSIS SOLUTION

The methods which have been described provide a definite objective manner of resolving the problem as discussed.

Verification of the problem is accomplished with minimum data gathering and clearly defined objectives. The method of gaining and maintaining control is both direct and subtle, accomplishing significant results with minimum disturbance to the system.

Another advantage which can be derived from the control system is control of clerical accuracy (e.g. bill preparation and pricing). The same samples used for the one may be used for the other. This can become a significant audit tool.

It should also be noted that this procedure has a great deal of significance to all industries with similar cash flow problems, particularly insurance, transportation, stock brokerage, and investment trust companies to name a few that have the same type of extensive and diverse cash collection points.

Recognizing and Evaluating Profit Opportunities

(Continued from page 478)

from day-to-day considerations of the business, and they must make their decisions by applying broad wisdom and judgment to the facts as developed for them by management. Obviously the presentation to directors is critical—it must contain all significant pertinent facts; it must be objective or unbiased; it must contain a reasoned recommendation; and it must avoid masses of detail and background information which are not vital for decision-making and which tend to confuse rather than help those who do not attempt to keep abreast of the myriad problems within the sphere of management.

Because the vital sections of the final recommendation document are necessarily given over to return on investment, availability of capital, and other figure data, responsibility for the preparation of this document is often delegated to the financial and accounting staffs. Theirs is the task of collecting all the pertinent information, of sifting and collating, of challenging if necessary the reasonableness and accuracy, and finally of putting the whole mass together into a single concise, coherent story which will lead an intelligent reader through

(Continued on page 506)

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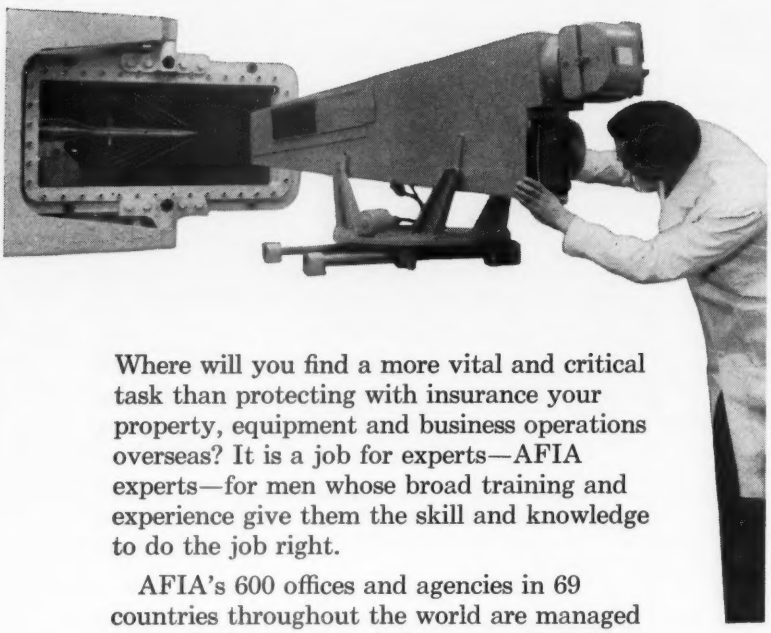

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Recognizing and Evaluating Profit Opportunities

(Continued from page 505)

a logical presentation to a sound conclusion. This is a problem of communication—the decision is not "sold" to directors; it should be reached as the only decision that could logically result from the demonstrated facts or the recorded assumptions. If this final document fails in its task, all the work of the research and development staffs, market analysts, economists, engineers, lawyers, accountants and others concerned in the various studies has gone for nothing.

Fundamentally, the directors' primary responsibility is to ensure that management earns a return on shareholders' investment commensurate with the risk involved in the business. The greater the risk, the higher the return needed to justify taking the risk. Because entry into virtually all new enterprises involves risks to a greater or lesser degree, forecast return on new investment is the dominant or determining factor in the final decision. A statement of anticipated return on investment is not sufficient in itself, however. It must be backed up with other significant information which would be helpful to the directors in assessing basic assumptions and which would give important support to the recommendation of management. No blueprint can be laid down for a document of this type to suit all projects in all companies, but there are common sense guide rules that usually apply.

The first is to know your directors, and particularly their primary personal interests, as this will bear importantly on their approaches to the proposal. The second is to know the degree of information they expect for purposes of reaching a decision—too little may arouse suspicion or a feeling that one is trying to "put one over"; too much will be confusing and may cause them to feel one is covering something up or is trying to get them to accept management responsibilities. Third, go to the trouble of giving them a well-conceived document sufficiently ahead of the meeting so that they can have an opportunity to do some basic thinking and participate intelligently in discussions. Directors are only human—some of us are classified among that mystical body—and the old rule of treating them as you would

(Continued on page 507)

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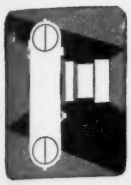


THE CONTROLLER CAMERA COVERS A DIRECTORS MEETING

A large turnout of national officers and directors and other officials of Controllers Institute of America were present in New York on August 23 when the meeting marked the close of the Institute's 1956-57 fiscal year and the induction of James L. Peirce as national president. Mr. Peirce, who is seated second from the left, is vice president and controller of A. B. Dick Company, Chicago, Ill.

At Mr. Peirce's right is Harold A. Ketchum, who was re-elected president of the Institute's research arm, Controllership Foundation. He is financial vice president of Federal Pacific Electric Company, Newark, N. J.

(*Proceeding rightwardly from Mr. Peirce*): Dudley E. Browne, Institute national president, who is now serving as chairman of the national board of directors; Robert N. Wallis, retired chairman of the board who is now a director at large; Paul Haase, Institute managing director; Stuart W. McLaughlin, treasurer of the Institute; Vincent C. Ross, past national president; Mark Z. Hanlon and George H. Hetley, national directors of the Institute.

Those standing (*left to right*) are: Victor L. Persbacker, E. E. McConnell, James F. Lillis, George E. Hallett, Harry C. Hahn, Murray S. Gelber, Ralph H. Smith, Charles H. Clifford, Fred H. Brown, Carl M. Blumenschein, L. W. Bennett, W. A. Crichley, C. C. Lay, Raymond G. Lochiel, Donald P. Jones, George W. Schwarz, Wm. C. Jones, Charles H. Yardley, B. A. Johnson, L. Keith Goodrich, J. H. Reid, Eric L. Hamilton, Warren M. Maule, Malcolm S. Sutherland, Edward H. Eaton, E. W. Weston, W. T. McGillivray, Kenneth J. Plant (*rear*), A. J. Mayer, Earl R. Uhlig, C. R. Fay, Stuart T. Henshall (*behind Mr. Fay*), Lewis E. Frensley, David F. Devine, and George L. Todd.

Recognizing and Evaluating Profit Opportunities

(Continued from page 506)

expect your own staff to treat you is still pretty sound.

Now, what goes into the final recommendation document?

Each such report must be tailored to the specific project, but again there are broad rules that apply more or less to all. Usually, there are only a few salient factors that will be weighed against each other at the decision-making stage, and the report should be designed around these—possibly even be limited strictly to them. These salient factors are:

Market forecast in general terms, and the fundamental assumptions on which it is based;

Financial forecast, summary of revenues, operating costs, expenses, financial charges and net income, and return on investment;

New capital investment summary, showing both fixed and working capital;

Plant location considerations (often surprisingly important if directors come from widely scattered areas);

Incidental information such as patent situations, if these are sufficiently important to have a bearing on the final decision; and

Availability of capital and recommendation.

For the most part these various sections of the final document are comprised chiefly of figure schedules or rely on figures for extensive illustration. The narrative sections should be a concise relation of facts, with the minimum of supplementary commentary, most of which is usually interpreted as leading the reader by the nose! Let's run over each briefly.

The fundamental assumptions on which a market forecast will be based are future over-all economic trends, a summary of sales broken down by consumer groups, size of the total market for the product and the degree of market penetration expected, summary of competitive position, forecast of selling-price trends, possibility of product obsolescence, extent to which market may be varied by varying size of plants, selling prices, or both. These are the key to the

(Continued on page 508)

Recognizing and Evaluating Profit Opportunities

(Continued from page 507)

reasonableness of the market forecast—directors do not need to be told why these assumptions were made unless they ask, but they are entitled to know what the assumptions were and to use their own broad business judgments in deciding their validity.

There is no need to expand on the financial forecast summary. This is strictly a figure schedule, showing the financial results that will flow if the market assumptions and engineering estimates are accurate. The financial schedule should, however, disclose any important assumptions not shown elsewhere, such as raw material price trends, any special situations on raw material supplies, labor rate trends, depreciation rates, and so forth. Again, these are assumptions which have a significant effect on the profit position and are all matters on which directors may bring their broad judgments to bear.

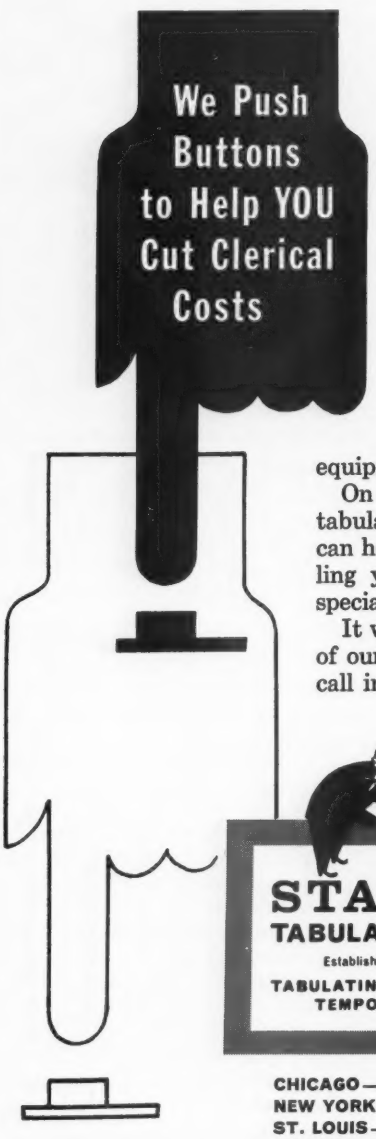
The new capital investment summary is also primarily a financial schedule, to show the money needed for site costs, plant construction costs, and working capital. Directors do not want to look at detailed engineering cost estimates by building or by piece of equipment, but they do want to know the margin of accuracy of the estimate (as, say, plus or minus 10% or 20%), the extent to which contracts are at fixed prices, allowances for contingencies, and so forth. On working capital items they may want to know the number of months' supply of materials in inventories.

Plant location considerations are important because the placing of a plant at an advantageous location opposite markets, opposite competitors, or opposite raw material supplies is so often a factor of sufficient importance in costs to make the difference between an attractive and unattractive project. For example, expansion at an existing company site is almost always more economical on the surface, because use can be made of existing facilities, avoiding the major cost of developing a new site, and subsequent organization demands will be less.

By expanding an existing plant, important operating economies may be possible. Against this, however, location opposite customers and competitors may be a dominant factor. Markets move, and customer service is often vital. A plant built years ago may now be far away from many of its customers, and a closer competitor may be gaining an advantage. These are all factors of sufficient importance to influence final decisions, and should be summarized for directors.

Now, one section for incidental information because the preliminary evaluation studies such as the detailed market analysis, the engineering study, the research study or pilot plant operations, usually develop certain important facts which do not fit logically into the other clearly defined sections but which may well be of significance in the final evaluation of a project.

(Continued on page 509)



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Recognizing and Evaluating Profit Opportunities

(Continued from page 508)

Finally comes the summary of availability of capital and recommendation. Availability of capital is significant in the evaluation of a project to the extent that new capital must be raised, or capital used which will thus be no longer available for other foreseeable projects. The return on investment must be enough to cover the interest and amortization costs of borrowed money as well as a margin equivalent to the insurance against the risk which falls on shareholders rather than on suppliers of debt capital.

DECISION TO PROCEED

The decision to proceed with a new project stems logically from the evaluation compiled by management. From the above document, directors can, by exercise of personal judgment, assess this evaluation, reach a conclusion on its validity within reasonable limits, and decide whether the financial returns justify the commitment of shareholders' capital. Effort has been made to show that the evaluation is simply a collection of the pertinent economic, scientific, commercial, engineering and financial facts, summarized in terms of a common denominator—dollars—adjusted to conform to an agreed set of assumptions estimated as being most likely to be valid under the conditions foreseen, and finally expressed in a form comprehensible by wise and prudent individuals whose business judgment is more important than a possible lack of knowledge of the day-to-day problems of management. Once the decision has been reached, speed is essential in carrying out the recommendation, as secrecy is usually gone, competitors may be in a position to move quickly, plant site costs still unfirm will rise, and other similar adverse events may occur.

OTHER POSSIBLE AVENUES FOR IMPROVING EARNINGS POSITION

So far, profit opportunities have been discussed in terms of new products or new businesses. However, it would not be doing justice to the subject if reference were not made to some other types of profit opportunities with which management is bound to be concerned in the years ahead.

There must be a constant review of existing business, to decide whether plants should be expanded to meet growing demand, whether profitability of the business would be greater if competitors were left to supply increased demand, or whether capital can be better employed elsewhere thus making it desirable to dispose of existing facilities. Most of the evaluation factors are the same as for a new product, except that the scientific research and engineering studies are usually much simpler or nonexistent, and market, cost and profit estimates are usually much more accurate. Markets must be estimated, economic conditions forecast, competitive positions analyzed, price trends studied, product obsolescence risks weighed, and plant site locations considered if there is a possibility of expansion at a new location. The evaluation by management and any subsequent presentation to directors thus takes a form substantially similar to that for a new product or business.

When considering the elimination of existing operations, it is important to recognize objectively the extent to which operating costs in other units will be affected by changed situations in the allocation of indirect costs, administrative expenses and similar items. There is an amazing degree of inertia in most organizations on these types of cost and expense, and an objective assessment of the resistance to cutting "fixed expenses" is necessary for an honest evaluation of the financial effects to result from disposing of any operating unit. Personal loyalties to fellow em-

(Continued on page 516)

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Whole-Dollar Accounting

A new research report dealing with a work-simplification idea and related techniques applied to accounting operations has been released by Controllership Foundation, research arm of Controllers Institute.

Entitled "Whole-Dollar Accounting," the study has an analytical chapter which provides a summing up and a general analysis of the results of the Foundation's research on whole-dollar accounting and business experience in using it.

Major topics covered in the analytical chapter include: A description of whole-dollar accounting; an appraisal of the results of research into the subject and a recommendation based on the results; a summary listing the advantages of whole-dollar accounting as well as its limitations; and an illustrative exposition of the advantages and limitations.

In addition, the report contains 13 case studies of the experience with whole-dollar accounting plus appendices supplying materials pertinent to the subject.

Copies of the new study are available from Controllership Foundation, Inc., Two Park Avenue, New York 16, N. Y., at $7.50 per copy (price to members of Controllers Institute is $6.00 per copy).

How Much a Salesperson Should Sell

A salesman receiving $60.00 per week in a hardware store having a yearly sales volume of $125,000.00 in a city of 25,000 population should sell $525.00 worth of merchandise each week to justify his salary. This information, and similar information on many different lines, is developed in a booklet *Expenses in Retail Business* available from the National Cash Register Company, Dayton, Ohio.

CONTROLLERSHIP INFORMATION SERVICE

Some By-Product Specifics of Controllership Foundation's Research on

WHOLE-DOLLAR ACCOUNTING

Basic research related to the Foundation's new research report, "Whole-Dollar Accounting," has brought to light some interesting side lights on the possibilities of adapting this accounting work-simplification idea. These will be reported in the Foundation's *Research Notes* during the next several issues of THE CONTROLLER.

An adaptation of the whole-dollar accounting concept has been made in a few cases in this country and England in making up payrolls paid in cash. For this time, the Foundation reports on English practice. We hope to get clearance for reporting an American company's story in next month's issue. In England, however, the Port of Bristol Authority has for several years been using a "ten-shilling" payroll procedure which is approximately equivalent to the whole-dollar idea. Under this procedure, the weekly pay of each employe is made up to the nearest 10 shillings *above* the amount due him after taking into account the balance brought forward from the previous week. While this does not eliminate coins completely, it reduces the number and kind of coins which have to be put in pay envelopes.

J. Lyons and Company, Ltd., go a long way toward reaping full benefits from such a procedure by working to units of 2 shillings, sixpence (2s. 6d.). This is done in the payrolls prepared electronically for more than 8,000 of its employes. The company does not overlook or lose track of the adjusting "overpayment" when the employe's pay is made up to the nearest 2s. 6d. above his true net pay. This sum is carried forward as a personal balance, and is taken into account when the following week's pay is computed.

The types of savings resulting from this procedure come from significant reduction in time required to make up the pay packets, checking the amounts and controlling the cash involved. Employes reportedly react favorably to the system.

This Electronic World

A character recognition device, produced by the English firm of Solartron Electronic Group Limited, reads both alphabetical and numerical information with a photoelectric eye. The machine, called ERA, is being used by a large English retail chain store where cash register slips from store branches are sent to a central office for ERA to digest the information and transmit electrical impulses to computers.

•

Comptometer Corporation has developed a machine to convert calculator results into punched paper tape ready to be fed into processing machines with tape-reading mechanism. The machine also has a program board which automatically punches constant data, such as code numbers, into the tape, freeing the operator to do actual calculating.

Local Income Taxes

Local income taxes are now being levied and withheld from wages, salaries and commissions by many city governments in four states according to Commerce Clearing House. The legislatures of Kentucky, Missouri, Ohio and Pennsylvania have empowered taxing officials of local jurisdictions to assess and withhold at the source taxes on net income earned within their respective legal limits. Rates of taxation vary from ½ of 1 per cent to 1½ per cent per m.

GNP

Gross national product was at an annual rate close to $434.5 billion in the second quarter of 1957, $5 billion higher than in the first quarter and $23.5 billion above the second quarter of 1956.

The Old School Tie

Some 700 major business organizations now use specially made four-in-hand ties as sales aids in furthering recognition of their products and trademarks. In some cases, the companies give the ties for length of service, commemoration of company anniversaries, gifts by dealers and distributors to their employes and customers, and to mark completion of special company training courses.

Atavistic Arithmetic

St. Louis public schools are using the abacus as a teaching aid in all first and second grade classrooms to acquaint pupils with addition, subtraction, multiplication and division.

NATIONAL COMMITTEE CHAIRMEN ★ CONTROLLERS INSTITUTE

JAMES L. PEIRCE, vice president and controller, A. B. Dick Co., Chicago, chairman, **Executive Committee,** which sets standards and regulations for Institute headquarters; acts in emergencies between Board meetings.

EARL R. UHLIG, vice president-finance and controller, the Martin Company, Baltimore, Md., chairman, **Budget and Finance Committee,** which prepares annual CIA budget; suggests ways of increasing revenue and limiting expense.

JOHN C. BARROWS, vice president and comptroller, American Surety Company of New York, chairman, **Ethics and Eligibility Standards Committee,** which keeps up to date Institute concepts of purpose and quality of membership.

STUART T. HENSHALL, controller, Merck & Co., Inc., Rahway, N. J., chairman, **Admissions Committee,** which decides the eligibility of all membership applicants in accordance with the by-law rules of membership and admission.

Bond

JOHN F. KIDNER, comptroller, Canadian Oil Companies, Limited, Toronto, Ontario, Canada, chairman of the **Canadian Affairs Committee,** which makes contacts with the Canadian government and other Canadian organizations.

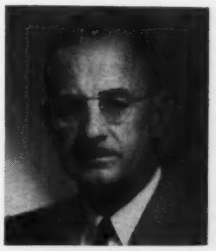
HANS C. TODT, comptroller, Bristol Laboratories Ltd., Syracuse, N. Y., chairman of the **Education Committee,** which promotes knowledge of career requirements and opportunities relating to the training for controllership.

GERALD L. PHILLIPPE, comptroller, General Electric Company, New York, chairman of the **Federal Taxation Committee,** which studies tax situations and their effect and offers its recommendations to Congressional committees.

R. B. GOOKIN, comptroller, H. J. Heinz Company, Pittsburgh, Pa., chairman of the **Management Planning and Control Committee,** which works for acceptance of the planning and control concept to improve profits and business stability.

J. McCALL HUGHES, vice president and controller, Mutual of New York, New York, chairman of the **Planning Committee,** which functions as a policy body on long-range objectives, progress and usefulness of Controllers Institute.

WILLIAM H. ZIMMER, vice president-treasurer-director, Cincinnati Gas & Electric Co., chairman, **Securities and Exchange Regulation Committee,** which studies and reports on the general rules and regulations released by SEC.

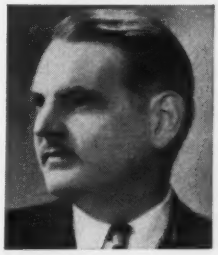


HARRY Y. WRIGHT, vice president and treasurer, Fidelity and Deposit Company of Maryland, Baltimore, chairman of the **Social Security Committee,** which considers proposals regarding the national Social Security program.

PAUL A. RECK, asst. treasurer-asst. controller, Sperry Gyroscope Co., Div., Sperry Rand Corp., chairman, **State and Local Taxation Committee,** which keeps up with all tax matters and makes recommendations for tax improvement.

R. W. MICHIE, vice president, Chesapeake & Potomac Telephone Co., Washington, D. C., chairman, **Advisory Panel on Cooperation with the Government,** covering government matters not assigned to other Institute committees.

CLYDE SKEEN, controller, Boeing Airplane Company, Seattle, chairman, **Advisory Panel on Government Contract Profit Limitations,** which deals with laws and regulations covering suppliers who serve the Federal Government.



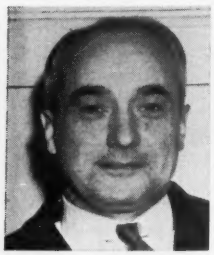
THOMAS M. McDADE, controller, General Foods Corp., White Plains, N. Y., chairman, **Panel on Accounting Procedures,** which works closely with the American Institute of Certified Public Accountants on accounting principles.

★*Each national committee is composed of regular members and an advisory panel for executive functions. Also, there are special advisory panels for specific problems not covered by regular committees.*

Personal Notes

TOP MEN . . .

John D. Grayson has been named president of J. I. Case Credit Corp., Racine, Wis., a newly created unit of J. I. Case Company. . . . **Robert W. Hood** was elected president of Office Service Company, Inc., New York. . . . **O. T. Fitzwater** recently became president of Indianapolis Power & Light Company, Indianapolis, Ind.

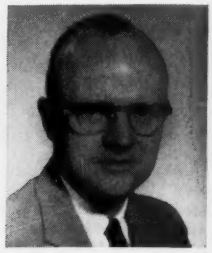


MR. GRAYSON

MR. BENDER

MR. PARSONS

MR. GRIEM



MR. MOYER

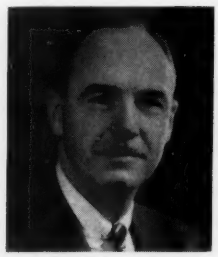
COMPANY CHANGES . . .

Langendorf United Bakeries, Inc., San Francisco, Calif., recently announced the election of **Lawrence S. Parsons** as executive vice president and **Louis O. Bannard** as treasurer-comptroller.

MR. VICKERY

MR. WALKLEY

MR. BELOW



MR. COPELIN

MR. SISTO

NEW CONNECTIONS . . .

Robert F. Bender has been elected executive vice president-finance of International Telephone and Telegraph Corporation, New York. . . . **W. W. Cox** is now treasurer and controller of the Chemical and Industrial Corp., Cincinnati, Ohio. . . . **Melvin E. Rubenstein** is assistant treasurer of Rosenthal & Rosenthal, Inc., New York.

Benton & Bowles, Inc., New York, has announced that **William W. Vickery** has become their vice president-finance and controller. . . . **Lawrence E. Walkley** was elected vice president of Westinghouse Air Brake Company, Pittsburgh, Pa. . . . **E. P. McGavin** is director of hospital finance, Ontario Hospital Services Commission, Toronto, Ontario, Canada.

PROMOTIONS . . .

Edward R. Adams has been named to the newly created position of controller of Virginia-Carolina Chemical Corp., Richmond, Va. . . . **Emmett W. Below** was elected vice president-finance of Marathon Corporation, Menasha, Wis.; **Alden H. Christianson** was named controller to succeed Mr. Below.

John G. Copelin has assumed responsibility for all International Standard Electric Corp.'s activities in the West Indies, Central and South America, Australia, Canada and the Far East with headquarters in New York. . . . **Donald M. Crawford** has been elected treasurer and controller of ABC Vending Corporation, Long Island City, N. Y.

Campbell Soup Company, Camden, N. J., has named **Oscar H. Curry** vice president-administration planning; **C. Roger Stegmaier** succeeds Mr. Curry as controller. . . . **Edward H. Eaton** was elected vice president and treasurer of Pittsburgh Forgings Company, Coraopolis, Pa. . . . **Rolf Griem** was elected secretary of A. M. Byers Company, Pittsburgh, Pa.

The election of **Gordon V. Moyer** as treasurer of Frank H. Fleer Corp., Philadelphia, Pa., was announced recently. . . . **Fred B. Norberg** was named controller of Waste King Corporation, Los Angeles, Calif. . . . **Robert G. Olmsted** was elected vice chairman of the Board of Long Island Lighting Co., Mineola, N. Y.

Daniel D. Robinson formerly assistant controller has been named controller of New York University, New York. . . . **Louis S. Sisto** was recently appointed vice president of United Fruit Company, Boston, Mass. . . . The election of **John L. Ward** as controller and **Robert W. Foster** as assistant controller of Corning Glass Works, Corning, N. Y., was recently announced.

Norman E. Lang was recently elected comptroller of American Machine & Foundry Company, New York. . . . **Edward W. Jones** is now treasurer of Hamilton Paper Company, Miquon, Pa. . . . **Wistar H. MacLaren** recently became vice president and comptroller of the Philadelphia National Bank, Philadelphia, Pa. . . . Dayton Rubber Company, Day-

MR. MAYLE

MR. McGILVRAY

MR. JARCHOW

ton, Ohio, elected **Paul J. Mayle** executive vice president. . . . **David McGilvray** has been elected senior vice president of the Fyr-Fyter Company, New York.

RETIREMENTS . . .

Christian E. Jarchow retired on August 1 as executive vice president of International Harvester Company, Chicago, Ill., after 43 years of service. He remains a member of their board of directors. Mr. Jarchow served as president (1947-48) and chairman of the board (1948-49) of Controllers Institute of America, and is currently vice president and treasurer of United Charities of Chicago and a member of the board of trustees, National College of Education, Evanston, Illinois.

OVERSEAS . . .

Edwin E. McConnell, retired treasurer of Norton Company, Worcester, Mass., who is now living in Lake Worth, Fla., is currently in Europe on a two-month tour of various countries. He is a past national president (1945-46) of Controllers Institute.

NEW DIRECTORS . . .

F. W. Misch, vice president of Chrysler Corp., Detroit, Mich., to board of National Bank of Detroit. . . . **C. J. Kushell, Jr.,** vice president-finance of Montgomery Ward, Chicago, Ill., of the same company. . . . **R. W. Michie,** vice president of the Chesapeake & Potomac Telephone Companies, Washington, D. C., of Shenandoah Life Insurance Co., Roanoke, Va.

Kenneth C. Towe has been elected chairman of the Board of Directors of American Cyanamid Co., New York. Mr. Towe had earlier service as controller, treasurer and vice president in charge of finance. He succeeded the late **Raymond C. Gaugler** as president in January 1952.

EXTRACURRICULAR ACTIVITIES . . .

The 33rd Annual Convention of the National Association of Bank Auditors and Comptrollers will be held at the Biltmore Hotel, Atlanta, Ga., October 7-9, 1957. Presiding at the opening meeting will be **Steve Bomar,** president NABAC and senior vice president, Trust Company of Georgia, Atlanta, Ga.

Moderators and their subjects on succeeding days will be: Monday, October 7—"Pricing Our Services" **Charles C. Looney,** vice president, Harris Trust & Savings Bank, Chicago, Ill.; "Commercial Checking Account Coding—When, Which and How" **Alvin J. Vogel,** vice president, Central National Bank in Chicago; "Audit and Control Functions and Development of the Auditor and Comptroller" **Clarence H. Lichtfeldt,** comptroller, First Wisconsin National Bank, Milwaukee, Wis.; "Savings Bank Operational Problems" **William F. Schreiber,** comptroller, Erie County Savings Bank, Buffalo, N. Y.; "Tax Planning to Augment Profits" **C. Z. Meyer,** vice president and comptroller, First National Bank of Chicago, Chicago.

Tuesday, October 8—"Preparation and Use of Budgets" **Charles A. Agemian,** vice president and comptroller, Chase Manhattan Bank, New York, N. Y.; "Proper Accounting for Annual Reports" **Edward F. Lyle,** senior vice president and comptroller, City National Bank and Trust Company, Kansas City, Mo.

Wednesday, October 9—the morning season will be devoted to the NABAC-Armour Institute Research Program and the following will be among the speakers on various facets of the program: **Franklin D. Price,** comptroller, First National Bank, Dallas, Tex., **Harry Tubergen, Jr.,** vice president and comptroller, Merchandise National Bank of Chicago, Ill., **Henry J. Rohlf,** vice president, Mercantile Trust Company, St. Louis, Mo.

The Convention is under the chairmanship of **Hugh W. Fraser, Jr.,** vice president and comptroller, the Citizens & Southern National Bank, Atlanta, Ga. **Winslow E. Pike,** vice president and controller, the First National Bank of Atlanta and **Garnett Wood,** comptroller, Trust Company of Georgia, Atlanta, are vice chairmen; printing and publicity for the convention are being handled by **Joseph A. Hall III** vice president and deputy comptroller, the Citizens & Southern National Bank, Atlanta, Ga.

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(Continued from page 484)

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In summary, then: The peculiarities of the average payback method tend to pull it in different directions. When, as in the case of Project B, they happen more or less to nullify each other, the indicated rate of return may be not far removed from the valid rate of return. In general, however, this method gives results that are distorted, often very seriously, in one direction or the other.

AVERAGE INVESTMENT

Average investment, like average payback, fails to discount; consequently it, too, tends to overvalue.

Like average payback, average investment includes a deflationary device: the subtraction of the reciprocal of the number of years of a project's life. But the effect of this device is generally less than that of doubling a project's cost; in the case of a long-lived project it tends to disappear almost entirely. Consequently average investment is likely to overvalue even more seriously than average payback. Its average rate of return for the 14 projects in *Table 1* is 46.9 per cent—more than 16 per cent higher than average payback's and nearly twice the average shown by the discount method.

Since its deflationary effect is least on the longest-lived projects, average investment especially overvalues these. And since it neglects to distinguish between present and future dollars, it especially overvalues projects in which maximum returns come late.

When maximum earnings come late in the life of a long-lived project, the inflationary effects are compounded. The result may be a supposed return as unrealistic as —or even more unrealistic than—the rate indicated for Project D.

Conversely, average investment tends to penalize short-lived projects and those in which maximum returns come early. When maximum returns come early in the life of a short-lived project, average investment may even undervalue it, as it has undervalued L and M.

Summarizing the case against average investment, we may repeat what we said about average payback: Any time its peculiarities happen more or less to nullify each other, the result may be a rate of return not far removed from the valid one. Any time they do not, however, the answer this method gives may be unrealistic to the point of absurdity.

The short-cut methods, then, are inaccurate and undependable.

Yet we may sometimes put one of them to good use.

MAKING USE OF A SHORT CUT

There is no way to avoid calculating at least two columns of present-worth values in determining a project's rate of return according to the discount method.

It is often possible, however, to avoid the need to calculate *more* than two columns, and since calculation of present-worth values is a rather time-consuming operation, we should like to hold it to a minimum.

There are two ways by which we might do this. One is by "guessing" discount factors as far apart as possible. But the nature of compound-interest tables is such that the inaccuracy of the figure obtained through interpolation grows with the spread between the poles.

The other makes use of one of the short cuts, whose great—if not only—merit is their ease of calculation. This procedure will not always succeed in its purpose; a third, or even fourth, column of present-worth values may sometimes still have to be calculated. But it will often succeed, and the percentage of successful attempts will increase as the calculator gains experience.

We therefore recommend the procedure that follows. It will succeed somewhat less well with short-lived, marginal projects than with others, but it will always offer a chance of saving a good deal of time at the risk of losing only a little.

Step 1: Calculate the rate of return by the average payback method.

Step 2: Examine the stream of earnings. Then:

Step 3: (a) If maximum returns come *very early* in the project's life, experiment in Column 5 with a *somewhat higher* rate than the one indicated by average payback. (In this case, as in all the others, the rate attempted in Column 7 will depend largely on the total shown in Column 6.)

(b) If maximum returns come *moderately early,* try a rate *in the general neighborhood* of the one indicated by average payback.

(c) If maximum returns come *around the middle* of the project's life, try a *somewhat lower* rate than indicated by average payback.

(d) If maximum returns come *late,* try a *considerably lower* rate than indicated by average payback.

CHOOSING AMONG A NUMBER OF PROJECTS

If a corporation's problem is to select for development a smaller number of projects out of a larger number of possibilities, the process of decision does not end with determination of rates of return.

To illustrate: Apparently every one of the projects in *Table 1* will return some sort of profit. How do we choose among them?

Generally in one of three ways.

1. By fixing a dollar maximum for investment.
2. By stipulating a minimum rate of return.
3. By some combination of the first two. This third basis is the most common of the three.

TABLE 3

Project	*Life*	*Cost*	*Rate of Return*
B	5	$ 1,000,000	50.9%
H	12	7,000,000	35.0%
C	10	1,000,000	32.5%
D	19	8,500,000	31.7%
N	6	5,000,000	27.8%
I	10	9,000,000	27.1%
F	15	15,000,000	25.5%
L	5	500,000	24.8%
J	20	5,000,000	23.7%
A	5	1,000,000	17.4%
G	5	500,000	11.0%
M	5	6,000,000	10.4%
E	8	3,200,000	8.9%
K	3	400,000	6.1%

TABLE 4

Projects Chosen	B,H,C	B,H,C, D,N,I	B,H	B,H,C, D,N,I,F	B,H	B,H,C, D,N,I
Average Life (number of years)	9	10.3	8.5	11.0	8.5	10.3
Total Cost (000 omitted)	$9,000	$31,500	$8,000	$46,500	$8,000	$31,500
Average Rate of Return	36.8%	31.1%	37.3%	29.3%	37.3%	31.1%

In any of the three cases, we next build a "ladder"; we rank the projects under consideration according to their rates of return. The purpose, of course, is to give ourselves a quick, graphic means of comparison.

Table 3 shows the 14 projects in *Table 1* "laddered" according to the discount method.

We choose our projects by moving down the ladder as far as our limits of investment permit. *Table 4* shows the projects that would be chosen under six sets of circumstances.

Column 1: If total investment is limited to $10,000,000.

Column 2: If investment is limited to $35,000,000.

Column 3: If each project chosen must return at least 35 per cent.

Column 4: If each project must return at least 25 per cent.

Column 5: If investment is limited to $10,000,000 *and* each project must return at least 35 per cent.

Column 6: If investment is limited to $35,000,000 *and* each project must return at least 25 per cent.

Obviously, a company need not enslave itself to such a table; the table is merely a tool. To illustrate: Holding the investment limit to $35,000,000 eliminates Project F, which ranks seventh on the list. It need not, however, eliminate Project L, which ranks eighth, since money to develop L is available while money to develop F is not.

Further, a company need not base its capital-budget decisions strictly on financial factors. It may, if it likes, also consider non-financial factors: a project's national-defense aspects, for example, or its public relations or prestige values.

These last, however are not within the scope of this paper.

SUMMARY AND CONCLUSIONS

None of the popular so-called short-cut methods for calculating rate of return can substitute adequately for the discount method. Each short cut, in its own way, gives a distorted picture. The degree of distortion varies widely from method to method and case to case, but the range of coincidence between the discount method and any short cut is so slight that use of a short cut always raises a strong possibility, at least, of unwise and unprofitable capital-budget decisions.

Not only do the short cuts fail to give a true picture even under optimum conditions; their rigidity makes them incapable of adjusting to any sort of departure from "normality." The discount method, on the other hand, is characterized by great flexibility.

The discount method, while somewhat more difficult to apply than any of the short cuts, is *much less difficult than it is generally supposed to be.* Certainly it involves no concepts that cannot be easily understood.

Its only real disadvantage in comparison with the short cuts is that it requires more arithmetical calculations. But even this disadvantage can sometimes be mitigated by proper *preliminary* use of a short cut.

Discussion of the discount method's difficulty, however, is almost irrelevant, *because there is no easier way accurately to determine a project's rate of return.*

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Recognizing and Evaluating Profit Opportunities

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ployes are strong and are often allowed to dominate decisions in this area. Companies do lose something when they act cold-bloodedly in disposing of units—it may be goodwill, or there may be a drop in internal morale, or adverse public reactions may militate against the company particularly opposite customers or potential new employes. These intangible factors form part of the evaluation of existing businesses, and while one may not be able to reduce them to dollars they should not be disregarded in arriving at a recommendation. An organization which is successful over a long period is invariably a good citizen—opposite government, customers, suppliers and employes.

If a decision to close down an operation or dispose of it is obviously sound, this fact can and should be explained to employes, to customers or to government, each of which is composed mainly of rational human beings capable of understanding facts. All secrets need not be bared to the world, but valuable goodwill will certainly be lost if a company does not take the trouble to give others information to which they are reasonably entitled in relation to their interests in the business so that they too can appreciate that the recommended action is sound and fair.

Another constant area for searching out profit opportunities is the improvement of efficiency throughout the organization combined with sound organization planning to ensure that duplication of effort is eliminated, and that auxiliary (or nonline) functions are restricted to those that are clearly necessary or justified. There is no need to go into the evaluation of such profit opportunities—this is solely a question of satisfying oneself that all costs and expenses return, in the form of goods or services, their value plus some return.

CONCLUSION

Thus, the main opportunities for increasing profits can be summed up under four headings:

1. Expanding profitable operations if markets are growing.
2. Entering new fields where profitable markets exist or can be developed and the necessary skills or knowledge are available.
3. Eliminating operations which are no longer profitable.
4. Constantly reviewing main cost and expense centers to minimize extravagance and waste.

All four avenues are constantly open (expansion and diversification may offer the most interesting routes to higher profits). At the same time, however, introspective studies leading towards elimination of unprofitable or obsolete businesses and reduction of unnecessary expense or extravagance are a constant challenge to every organization for the company which maintains complacently that it has achieved full efficiency has also achieved a corporate state of mind that can lead only to stagnation!

In the constant search for, and evaluation of, new profit opportunities, those in the accounting and financial end have a role which is sometimes difficult and often unpopular. When facts, forecasts and guesses are being reduced to figures one must be absolutely objective and rigidly honest in assessing the validity of information. It must be recognized that enthusiasm for new possibilities is an essential part of the make-up of the research scientist or development specialist, but one must see to it that one is not carried along on a possible rosy surge of optimism. It is proper that much of the direct contribution by an accountant may well be in the constant questioning and challenging of information and assumptions which underlie the apparent financial facts of new projects, and this very contribution is often looked upon as throwing cold water or dampening enthusiasms. Hence, financial men earn the reputations for being cold-blooded, unimaginative and penny-pinching. That, however, is their role!

Nevertheless, one must avoid going to excess. Too much cold water would drown initiative, and one's own reputation and standing, and therefore value, will suffer if judgment is unbalanced towards the cold-blooded or penny-pinching approach. The job is to deduce from masses of information (colored or honest) the facts or valid assumptions which are pertinent to a sound evaluation of any proposal and to present them objectively in such a manner as to lead towards the proper decision. At times one's job may seem lonely, because strong men with pet projects have little use for the unimaginative ones who stubbornly refuse to be swept away by their enthusiasms. However, the accounting and financial staffs have a vital part to play in the evaluation of new profit opportunities, and they will serve their companies poorly if they allow themselves either to be swept away by waves of wishful thinking or alternatively to be stubbornly unreceptive to valid new, if unorthodox, ideas.

RELATED READING

Arden, Thomas T., "Preparation for Growth," THE CONTROLLER, February 1956.